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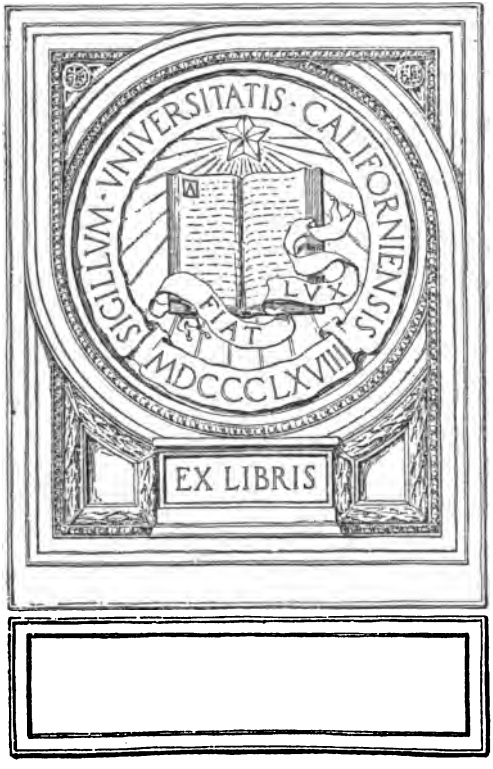
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Although there are many and different ways for employees to accomplish their tasks, however, there are only ***two perfectly distinct categories of employees.***

Some could be made willing to work with interest and even enthusiastically.

Some others, not only do they act as a brake, but sometimes even they strive to ***nullify*** *the very best efforts of the first ones.*

The degree of the management's ability ***to handle men*** *can be measured by the number of employees it was capable of bringing "over the top" from the lowest to the highest category.*

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FREDERIC MERON

MECHANICAL AND ELECTRICAL ENGINEER

UNIVERSITY OF LIEGE
BELGIUM

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MANUFACTURER'S
No. 3
INSTRUCTOR AND ADVISER

THE

HUMAN ELEMENT IN ORGANIZATIONS

AN EDUCATIONAL TREATISE ON THE

HANDLING OF MEN

CONTAINING ORIGINAL AND PRACTICAL DATA FOR ALL EMPLOYERS OF SERVICE SIMPLIFYING THE HELP PROBLEM

BASED ON INTERNATIONAL EXPERIENCE

BY

FREDERIC MERON, M.E., E.E.

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MANUFACTURERS' INSTRUCTORS and ADVISERS

Book 1

Layouts and Equipments of Factories.

Book 2

Common Sense Working Methods in Factories.

Book 3

The Human Element in Organizations (Handling of Men.)

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TO THE
READER

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PUBLISHERS' NOTE

Mr. Frederic Meron's work as presented in this series of "Instructors and Advisers" is original and based on long and varied **International Experience in installation,** organization, and operation of a great variety of industrial plants.

The common sense practical advice he gives appeals to all those interested in the work of Industrial Progress.

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The author's experience, often in capacity of mechanic, draftsman, engineer and general manager has brought him in very close touch with the men in the active field of industrial work, and these men will not only appreciate the valuable and money-saving information given, but will fully understand the conditions which caused the author to employ *sometimes very strong "shop language"* in presenting the subject—thus never failing to bring out the information and making this series masterpieces for service, study and application.

The Series is its own best recommendation.

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HOW TO ORGANIZE AN ENTERPRISE

What Is Profit?

General Considerations

What Should be the Constant Objective of Every Industry?

The constant objective of every industry should be:

1. To meet advantageously all competition, of whatever origin, both as to *price* and *quality* of the products manufactured, and
2. To obtain, in spite of everything, the greatest possible *profit.*

> In order to attain this end, however, the manufacturer must do everything in the *first place* to eliminate waste, and, *after that,* to employ better systems of manufacture and more modern organizations than his competitor, otherwise this is not possible.

Let us first consider the exact meaning of the term "profits." This may be defined as follows:

The "profits" *of a business are the difference between the selling price and the cost.*

The profits therefore depend on ***the difference*** between these two factors, and nothing more.

Thus, to increase the profits of a business, what is to be done?

As far as possible, increase the selling price and diminish the cost price so that the difference is a maximum.

However the former means is seldom possible, since competition usually fixes the selling price and it cannot be increased at will. Only one means remain: *the reduction of costs.*

Remark: Consider a business with a good reputation and a well organized selling force. The salesman will be forbidden to take away customers from rival houses *simply by cutting prices* (a poor and even sometimes dangerous method, as it makes the buyer suspicious).

It is far better to prove the superiority of an article, as compared with that of competitors, so as to justify in the eyes of the buyer the demand of a higher price than the competitor's.

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In any case, in determining possible profits, competitive prices should always be taken into account.

All our efforts should tend to reduce the cost, and to attain it, we have to employ all our intelligence, perseverance, and above all, our will-power.

Willingness is *not enough* it is ***perseverance*** and ***will-power*** that *is needed* and it must be manifested ***constantly*** and ***not intermittently,*** *despite all the difficulties and innumerable obstacles encountered.*

Elimination of Wastes in the Factory

As everybody knows, when a wounded soldier on the battle field is brought to the surgeon, the first thing the latter does is to have the wounded man's dirty clothes changed for clean ones.

After this, the man's wounds must be washed, particular attention being given to disinfecting the wound.

Only after all this has been done is it possible for the surgeon to begin the methodical curing of the affected part.

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The same thing happens in the factory where reorganization is to be undertaken.

The first thing to be done is:

1. To eliminate unnecessary waste which, in many cases, is very considerable and means the loss of large sums of money.

   Until this elimination of waste is effected, it is impossible to go ahead with any degree of success in the introduction of a new system.

   We must diminish the cost, but how are we to do it?

   It may be done by a rational organization of all the departments of the factory, but first, all waste of time and money, however slight, should be avoided; this is all the easier because so many expenses are by no means necessary, as it was proven at length in Book Nos. 1 and 2, and as will be proven in the following chapters.

2. Find readily all the losses as well as their causes.

3. Find the proper means to reduce to their lowest value the causes of these losses by means of the least possible expense, both of money and time.

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4. Indicate in every case a special system of supervision, allowing the head of the firm to follow without difficulty and day by day the exact amount of the *losses*, of their *causes*, and of the *effect* produced on the latter by the means adopted to combat them.

   To know how to employ men and have records that are simple, clear and precise, so that all those concerned can judge at a glance how the business is progressing.

Thereafter I will consider the problem more in detail.

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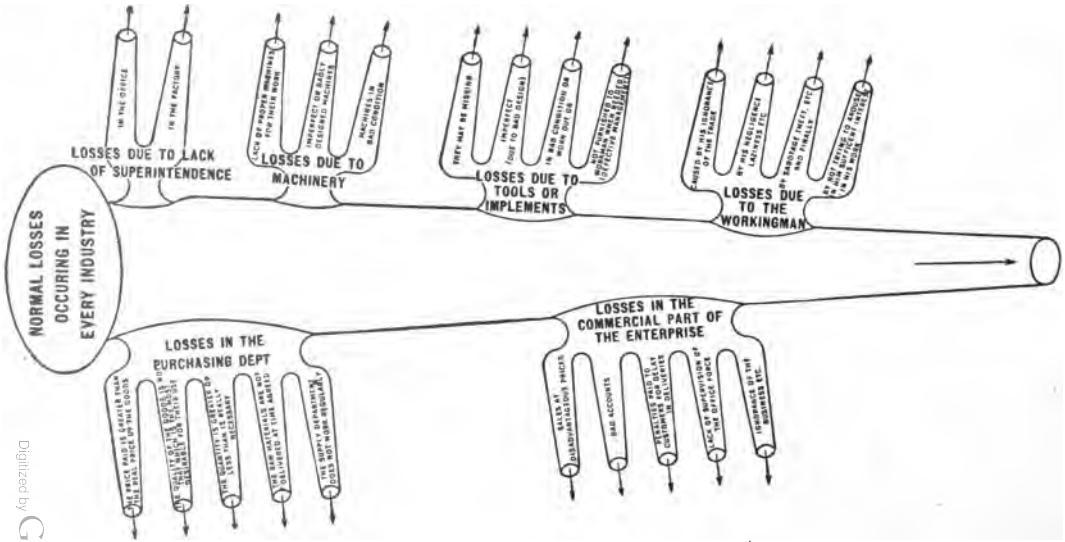
NORMAL LOSSES OCCURING IN EVERY INDUSTRY
LOSSES DUE TO LACK OF SUPERINTENDENCE
IN THE OFFICE
IN THE FACTORY
LOSSES DUE TO MACHINERY
LOSS OF PROPER WORKINGS FROM THEIR WORK
INSUFFICIENCY OF EARLY DESIGNED MACHINES
MACHINES IN BAD CONDITION
LOSSES DUE TO TOOLS OR IMPLEMENTS
THEY MAY BE MISSING
IMPERFECT DUE TO BAD DESIGNS
IN BAD CONDITION OR WORN OUT OR
LOSSES DUE TO THE WORKINGMAN
BY THE NEGLIGENCE LAZINESS ETC
BY DRUNKENNESS THEFT, ETC
LOSSES IN THE PURCHASING DEPT
THE PRICE PAID IS GREATER THAN THE REAL PRICE OF THE GOODS
THE QUANTITY IS GREATER OR LESS THAN REALLY NECESSARY
THE SUPPLY DEPARTMENT DOES NOT WORK REGULARLY
LOSSES IN THE COMMERCIAL PART OF THE ENTERPRISE
SALES AT DISADVANTAGEOUS PRICES
BAD ACCOUNTS
PENALTIES FOR DELAY CAUSED IN DELIVERIES
LACK OF SUPERVISION OF THE SELLING FORCE
INSURANCE OF THE BUSINESS ETC.

FIG. 1.—Diagram of various kinds of losses occurring in any factory. They can be subdivided into six classes with subdivisions. The diagram resembles a large tapering water main with numerous tranches. The arrows represent in analogy, leaks in the tranches. These leaks, although even if each be small, are, considering the multiplicity of them, collectively great. All these leaks must be stopped, as must be evident to secure maximum effect.

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LOSSES THAT OCCUR ORDINARILY IN EVERY INDUSTRY

The amount of these different losses, to be taken as normal, vary, evidently, with the manner of organization.

The better an industry is organized, the less will be the amount of these losses, and conversely.

Enumeration of the Different Normal Losses Occurring in Every Industry, But Varying in Importance According to the System Of Organization in a Given Factory

Fig. 1 shows, in schematic form, the distribution or enumeration of the constant losses as just mentioned above.

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These are losses due to:

1. Lack of superintendence.
   - *a.* In the office.
   - *b.* In the factory.

This lack of superintendence causes a general slackness and a consequent deficiency in the output.

2. Machinery conditions.
   - *a.* Lack of proper machines for the work required.
   - *b.* Imperfectly or badly designed machines.
   - *c.* Machines in bad condition.

These causes produce a deficiency of output, which leads to an excessively high unit cost. Moreover, many pieces are spoiled which increases still more the unit cost.

3. Tools or implements.
   - *a.* They may be missing.
   - *b.* Imperfect (due to bad design).
   - *c.* In bad condition or worn out, or
   - *d.* Not furnished to the workmen when needed (defective hauling).

4. Workmen.

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a. Caused by his ignorance of the trade
b. By his negligence, laziness, etc.
c. By sabotage, theft, etc., and finally
d. By not trying to arouse in him sufficient interest in his work.

His superiors do not encourage him, and advise him in the adoption of a better system of working than that to which he is accustomed, nor do they try to develop interest and good will for the employer, etc.

5. Conditions in the purchasing department.

a. The price paid is greater than the real price of the goods.
b. The quality of the goods is not best adapted for their use.
c. The quantity is greater or less than is really necessary.

In the first case, one loses the use of current funds, as well as the interest they should be drawing; the other causes stoppages in the normal working of the establishment.

NOTE.—Everyone will agree that there are different ways of accomplishing tasks. We may work, for instance, if not with enthusiasm, at least with a great deal of willingness, especially where there is the feeling of gratitude, or of some kind of profit, as, for instance, the hope of obtaining a better position, etc. On the other hand, moved by a feeling of dissatisfaction, anyone will take advantage on all the occasions that offer to neglect his work, or even to injure the interest of the employer, both morally and financially. These two cases are the extreme limits of working manners, but between these limits there remain a long series of graduations. Some employees, for instance, give only just as much as they dare not refuse. This much is required, it must be done, otherwise they would risk being discharged, but on the other hand, any occasion or any pretext will serve for doing as little as possible. Finally, there is another intermediate class that is content to do its duty and no more. Its only care is to satisfy what it calls its "conscience" and to await, as patiently as possible, the arrival of pay day. If the management know how to make the proper use of the Human Element, it can transfer the employees from the lowest to the highest point of efficiency.

d. The raw materials are not delivered at the time agreed,

This results in further stoppages in the course of the work and finally,

e. The hauling department does not work regularly,

That is to say, the materials are not distributed, to the shops at the time they are needed.

6. Conditions in the commercial department.

a. Sales at prices too low.
b. Bad accounts.
c. Penalties paid to customers for delay in deliveries.
d. Lack of supervision of the office force.
e. Ignorance of the business, etc.

This, in a general way, is an enumeration of the different kinds of losses that a manufacturing enterprise may suffer.

It is evidently impossible to name them all; they are both direct and indirect, but this will be quite sufficient to give a correct idea of the troubles constantly encountered.

The knowledge of these, and of their limits will greatly facilitate the research and the deeper study of the remedies already employed, as well as those proposed.

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Having this in mind, I ask:

"How many American manufacturers can boast of having a *perfect organization?*"

Perfect Organization

What is the definition of this term?

By perfect organization, I mean that ***all*** *the departments are organized so as to* ***work together*** *and* ***help one another,*** *instead of getting in one another's way.*

It is true that in certain industries there is the beginning of an understanding of the utility and necessity of methodical organization. But even there we will find that these industries are only partially organized; that is to say, that here and there a department has been thoroughly organized, but we will rarely find (if ever), an industry where *all* the departments are perfectly organized.

I would like to give still other definitions of the term "rational organization."

NOTE.—It should be remembered that the mechanism of a factory is comparable to that of a watch. No matter how good may be the execution of each part entering into the mechanism, this is not enough to make the watch go. The slightest defect of adjustment of the parts may be fatal, thus, for example, if the hair spring be not set right, the mechanism will not work properly.

These terms, I will admit, are certainly expressed in a less academic manner than that I gave before, but on the other hand, it has the advantage of being considerably clearer and it will be, I am sure, more easily understood.

What is the difference between

1. A man who uses a logical and rational system in all his doings, and
2. A man who does not follow a rational system?

The difference is the same as that existing between a *man* and an *animal.*

An animal is able to see only those things which are immediately in front of its eyes, but once the objects are removed all trace of its impressions disappear from its vision.

If it do something it *ought not* to do, it will not notice this (or understand) and at any rate will continue to make the same mistake. This may be explained in the following manner: The mind of the animal is not developed and consequently it does not know how to reason.

It follows that *it is not able to draw conclusions from what it has seen in the past nor draw from the past and present what may happen in the future.* In factories we can observe the same phenomenon. As a matter of fact *many men* make countless and costly

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mistakes. They did it yesterday, they do it today and will continue to do it in the future as soon as the slightest favorable opportunity will present itself. They seem not to notice the unlimited harm the consequences that their activities are causing to the interest they are supposed to defend. Curious as it may appear, but it is nevertheless a naked fact, this poor manner of acting does not constitute a *monopoly* of men holding a small position. *Even* (and I could say very well "*particularly*") "higher up" employees are not immune from my reproach. The only difference that exists is that: *Small employees make relatively small and inexpensive mistakes while the "big men" make big and costly mistakes* (even out of proportion with their "greatness." . . . .). When you observe their manner of doing things you come to the conclusion that all these men act *first* and think afterward, if at all! ... What are the reasons? Is it the result of either mental dullness or laziness, incompetence (" It 'kain't' be done type") heedlessness ("I should worry type,") or ("I do not give a d . . . dime type") etc. This is of course *not* altogether immaterial. See last chapter of this book.

Asking someone to work in a systematic manner is equivalent to asking him not to act like an animal.

Is this asking too much of him?

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To ask somebody to work in a systematic manner means to ask him to use ordinary good sense or, as Americans say in very expressive slang, to use plain "horse sense."

Is it asking too much of anybody to use ordinary good judgment?

I want to prove that wherever system is used prosperity, justice and tranquillity reign for the manufacturer as well as for his employees.

Inversely, where system does not exist, continual losses in money occur, injustice reigns, and there is trouble and unhappiness for everybody.

When confusion exists in any organization, *honest* people never profit by it. On the contrary, they have to suffer a good deal from such a state of affairs.

To quote a French proverb: "Quand la mangeoire est vide, les anes se battent," *i.e.*, "When the manger is empty, the asses fight."

The same thing happens in a factory where no system exists.

Mistakes occur, everybody wants to avoid responsibility and tries to place the blame on somebody else's shoulders. This always causes injustice, quarrels

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and ill feeling between the employees themselves and between the employees and those who are in authority over them.

It is easy to understand that a man who has, for instance, hurt his finger badly will think twice before accepting the violent remedy which consists in the amputation of the injured member to avoid gangrene.

However, the remedy which a system brings to *all* trouble that you encounter in a factory is not the same. It is a remedy which gives relief without pain.

CONCLUSION

To the four general rules just enumerated I can add the following:

It is absolutely necessary:

5. To ***know how*** to eliminate, as much as possible, all kinds of unnecessary waste which exists in almost every factory.

   Waste is to be found in all factories, in some less, in others more, it depends only upon how the factory is managed.

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6. To determine exactly the ***actual maximum output*** of the machines and workmen which it is possible to obtain under existing conditions.
7. To find out the best means of ***increasing*** the output of machinery and men to the maximum.
8. To find out the ***source*** of the best machinery used by competitors.
9. To determine the ***exact unit cost*** before the prices are given in the factory, and not afterwards.

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SELECTION OF EMPLOYEES

Organization Charts

Knowledge Required for a Given Position

The Right Man in the Right Place

In the former chapters was given more general considerations on the aims that every manufacturer should pursue. Let us now pass to the details.

Before undertaking the organization or reorganization of a factory,

1. It is useful and necessary to study seriously what we want to do.

   There should be, therefore, a working program, each article which expresses clearly and precisely a principle that is not only simple of comprehension, but easy to follow.

2. We must define exactly the nature of each department we wish to reorganize, and the necessary knowledge for those who are to be the heads of each department.
3. The capabilities of each of his collaborators must be known, so as not to assign any duties to a person who is not fitted for them.

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4. Once the individuals, capable of doing the work are selected, the limits of their *rights* as well as their *duties*, must be defined.
5. It must be indicated to what extent one department depends on another and how the various departments are related.
6. Every one engaged in the business must be convinced that his advancement depends only on his personal merit.
7. The purchasing department (through which more than 50 per cent. of the funds pass), must be placed under the control of a person who is specially competent, and scrupulously honest

   Since locks are made to preserve honest men against temptation (for the dishonest will always find a way to get by the best of them) there must be a constant supervision of all the operations of the purchasing department.

8. Only indispensable information should be recorded.

   Thus avoiding useless, cumbersome and expensive masses of records which are far from being of any real service. (See chart Handling of material in shops, cost, unit prices, etc.).

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9. A good organization should be arranged so that its functions depend, not on an individual, but on a system.

   (On the other hand, as I said before each employee should be sure that his position is a stable one, and not subject to caprice or sudden financial changes.)

10. The company must be kept informed of what its competitors are doing, and its competitors should never be allowed to have better products and lower selling prices.

These are the ten commandments to observe, and may be summed up as follows:

To succeed in business, we must practice ***justice*** and ***good sense.***

Thus, we may overcome any number of obstacles.

It is the failure to observe these truths, simple and logical as they are, that is the cause of so many failures.

Few Remarks Concerning Commandment No. 1

In undertaking a reorganization, the tendency always is to criticize (and rightfully enough) the

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old system of "rule of thumb" and to wish to change everything. This is all very well, provided the new system be in every way better than the old one, but it is useless to demolish a system and introduce a new one that is not better.

A sick man cares very little what the name of his ailment might be. In other words, a sick man is not happier in case a physician, wishing to cure him from one disease, give him so many drugs that it puts his digestive organs out of order. What he wants is to be cured quickly and without pain.

Besides an entirely new system can never be introduced. This is only possible in an entirely new erected factory and not in one already existing; and, after all, it is useless to change merely for the sake of changing, so that, after studying seriously the existing system, one should keep what is good, improve what is capable of being improved and eliminate what is altogether bad.

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Do not think a factory is well organized simply

because it has been worked out by a set of formulæ, schemes and diagrams. This is by no means enough, and the proof is that the same business (say, for instance, a candle factory) installed in different countries, such as the United States, Canada, Russia, etc., would not necessarily give the same results because the same formulæ and diagrams were used.

Concerning Commandments Nos. 2, 4 and 5

I think that it would be useful to begin by working out for each industry a sort of code or index to all trades and specialties in which it is engaged. By the side of each there should be a list of all the qualities and training necessary for anyone occupying the position.

To illustrate I shall take two instances:

Let us consider the case of a construction shop of moderate size. There are to be considered

1. Purely *technical questions*;
2. Purely *commercial questions*; and
3. Questions which partake at the same time of both.

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All problems concerning the manufacturing itself, or the building, erecting and equipment of the factory, up-keep, power station, lighting, etc., are purely technical questions and can be solved *only* by a technical expert.

Similarly, commercial bookkeeping, typewriting, advertising, selling, etc., are questions of purely commercial nature, and should be solved *only* by a commercial expert.

As for the purpose of raw materials, and the orders received from customers, the supplies of raw materials, semi-, and finished products, etc., they are all questions which necessitate both technical and commercial knowledge.

To solve some problems it is necessary to be 90 per cent. engineer and 10 per cent. business man, while to be able to deal with other problems it is necessary to be 90 per cent. commercial man, and 10 per cent. engineer.

Let us take up now as a second instance, the case of a forge shop. We have said that in order to organize it properly every question must be considered. In the forge shop for instance, begin

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by determining exactly what is a "blacksmith, superintendent," "foreman blacksmith," a "blacksmith's helper," an "apprentice blacksmith," etc.

Define exactly the knowledge necessary for each, so that the title may be deserved.

Again, a blacksmith, for example, may know one or several other trades (besides his principal one of blacksmithing), but he should be above all chiefly a blacksmith.

If he is to be raised from this position to a higher one, he should have the special qualifications necessary for this position and not needed for the other.

Acting on these principles, when we speak, for example, of a superintendent, or a manager, we shall be able to state exactly what are the qualifications necessary for an applicant to possess in order to be entrusted with the given position. Conversely when a man has been given a title pertaining to a certain position, as for instance: works manager or chief engineer etc., it should

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be known on what matters to consult him, rather than some one else.

Organization Charts

FIG. 2

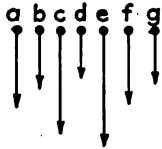

FIG. 3

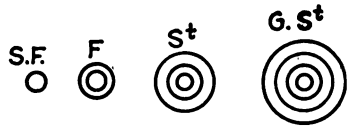

FIG. 4 TO 7

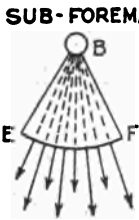

FIG. 8

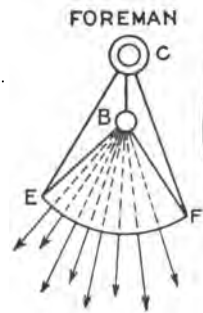

FIG. 9

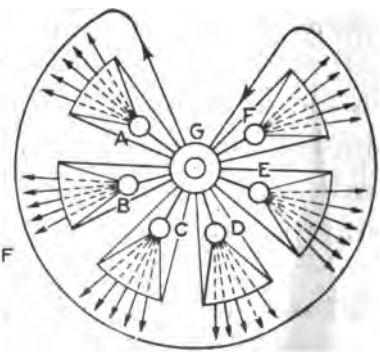

FIG. 10

FIGS. 2 to 10.—Organization chart, showing relation between workmen, minor shop officials and foreman.

Let us represent by little arrows *a*, *b*, *c*, etc., as shown in fig. 2, the individuals employed in the enterprise; mechanics, apprentices, helpers,

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laborers, etc. Fig. 3 represents a *squad* of workmen or apprentices, (turners, planers, stampers, drillers, etc.).

In figs. 4 to 7, represent by a circle a sub-foreman (or chief of a squad) and similarly by a double or triple circle, etc., respectively, a foreman, shop superintendent, assistant manager, manager, etc.

Fig. 8 represents a squad under the orders of its sub-foreman. The two lines B E and B F, form an angle; this means that the sub-foreman must keep constant watch over his squad.

Fig. 9 shows a squad with its chief; the sub-foreman is under the direct orders of the foreman. The sub-foreman is in direct relation with the foreman and with his squad. He has no relation with any one else.

I shall indicate exactly later the duties and rights of the sub-foreman and foreman.

The foreman keeps watch over the sub-foreman. The lines C E, and C F, show that he may deal directly with the workmen, without the help of

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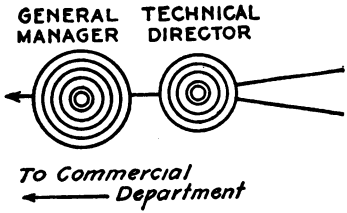

FIG. 11.—Administration chart showing relations between heads of different departments comprising the technical part of the factory.

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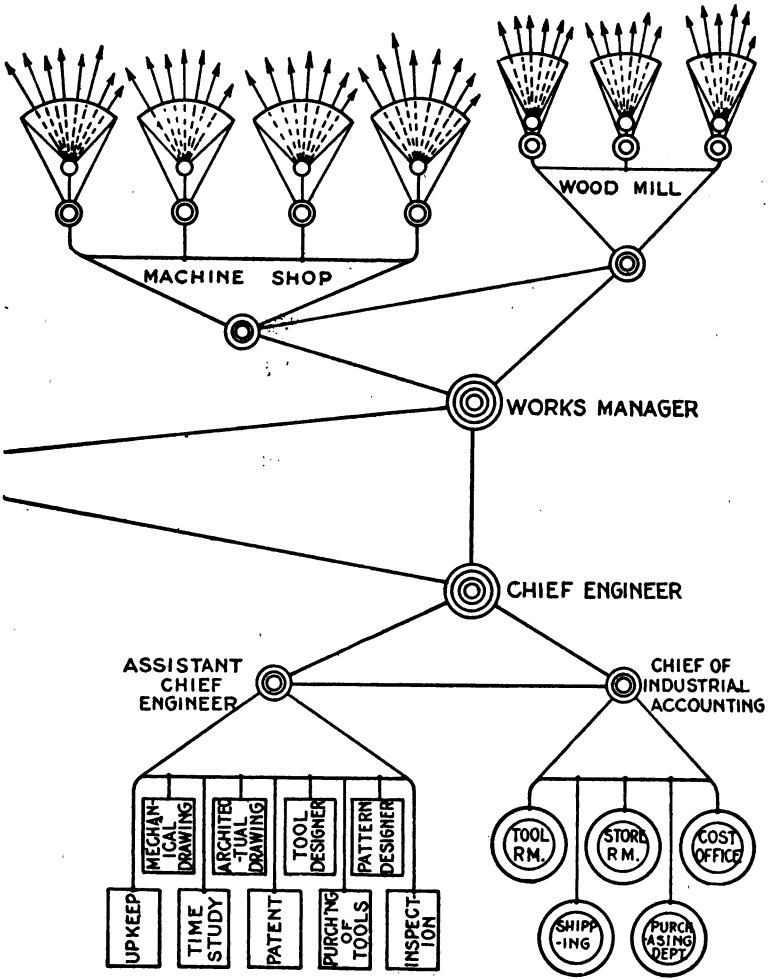

FIG. 11.—*Cut continued.*

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the foreman, and C B E and C B F, show that he may deal equally with them through the foreman.

Fig. 10 shows that the foreman has control over several sub-foremen. For instance, in a machine shop there may be a sub-foreman for the turners, one for the planers, one for the drillers, one for the millers, etc. The figure also shows that the foreman is absolute chief of his shop.

The arrows in the opposite sense show that everything going into or out of the shop must pass by the foreman. No other authority, of whatever rank, may go over his head and give direct orders to the workmen. The management not only can but must exercise control and co-operate as constantly as possible with each workman (as I shall explain later), but all its instructions to the men must pass through the foreman, or, at least, he must be kept informed of all orders and charged with their execution and the necessary supervision.

Figs. 8 to 11, are sufficiently clear and require no special explanation. I need only add that I will

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explain why certain services are required of certain persons rather than others.

Selection of Employees
The Right Man *in* the Right Place

One of the conditions which, in my opinion, is particularly important, is that of putting *the right man in the right place.*

You can't say to the first comer: "I shall make you director," or "you are to be factory manager," and expect to have a competent director or manager. You may give him all kinds of charts, indicate the limits of his duties, but this is not enough. You must above all, be sure that the person in question has the necessary knowledge and aptitude to fill the position. For instance, put a baker at the head of a machine shop, a thing I have actually seen; he may follow out the formulæ and diagrams given him, but the results of his work will nevertheless be deplorable. Moreover, contrary to what might be expected, the more intelligent he is, the more ingenious, and the more clever at "putting up a front," the more harm he can do the business, for he will be able

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to cover up his bad work, so that the facts will not become apparent until too late.

Thus, just as a suit of clothes must be made to fit the individual, the position given to him should correspond to his aptitude and knowledge capable of helping the business, otherwise he will be like a pebble dropped into a system of gearing.

I said before that it is necessary first of all to determine exactly:

1. What kind of knowledge is necessary in order to qualify an applicant for a given position.
2. How to select the right kind of individual who possesses the required knowledge and qualities which entitle him to be placed at the head of a given department.

It it ***interesting*** and ***useful*** *to be able to analyze quickly and surely the character and the aptitude of applicants for positions.*

This everybody ought to know, but principally such knowledge is indispensable to those who handle large numbers of men.

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Time and money is constantly lost from the very fact that we don't know how to find out the right man for the right place; this causes, in addition, a great deal of trouble.

No matter what we do, the results are the same. In other words, most of the splendid results obtained by inventions, improvements, or intelligent and hard work, get lost on account of the fact that men have been entrusted to deal with problems for which they are not fitted.

To illustrate: Suppose we need a head of a department. An advertisement is inserted in the paper, and twenty men call at the office.

Each claims to be capable of holding the given position.

How can we size up the men?

Which one shall we engage?

Suppose the candidate must possess (besides the knowledge of his own trade) tact, patience and perseverance and finally, he must like details.

How can we quickly decide who of the men possess the above named qualities?

This would have been easy if there were some ***marked characteristics*** to indicate with certainty that one applicant was better fitted than the others.

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Since we do not know these characteristics, we engage *at random* one or another of the applicants.

We have to give him at least a month's trial.

When the month is over what will happen?

It is possible either we will notice that he possesses only some, and not all, of the qualities required. Or again, we will see that he possesses not in the full degree the required qualities.

Shall we discharge him?

In this case we will have lost time.

Shall we keep him in his position?

In this case we lose continuously in the future, time and money, besides we will never be sure that things will go smoothly with him. Moreover, if at least we knew another man available who will give us more satisfaction than the first one, the situation would be better, but the trouble is the other man is, without being tried, an unknown quantity. It is more likely that we will discharge the first man, engage another man, and be just in the same position as with the first man.

This means, we will have to try again.

Evidently, it is relatively easy to find out the kind of knowledge a man must possess in order to be able to entrust him with a given position, but

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it is not so easy to size up men in order to know if a given individual be capable of filling the position offered to him.

Concerning Commandment No. 6

Usually the best positions in factories are given to those having a "pull," thus the merit alone does not always play a very important part in the matter. This is to be regretted and doubly so; from the point of justice, and also of the success of the business.

I am not, in principle, against men who are wealthy, or who get positions by means of a "pull."

In other words, I do not claim, that as a rule individuals who have a pull are necessarily not as intelligent as those who are obliged to struggle hard to get the position, but generally this is not very often the case. In fact, when an individual knows that he does not need to worry very hard to get positions (or to retain his position, once he has it) he does not feel the necessity to work hard, to be energetic and have perseverance, etc.

To prove my assertion, I advise taking a list of the best positions in a concern, and finding out how everyone holding these positions secured same.

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In doing this we will find out that it is always due to some influence that the position has been secured.

The results are very often that the lack of success of many enterprises is to be attributed to the fact that almost all responsible positions are to be found in the hands of men about each of whom it can be said *he is* ***not*** *the right man in the right place.*

Handling of Men

Some Rules to be Observed Between Superiors and Subordinates

1. In the first place work must be properly divided among the employees.

   Just as the foreman must know the capability of each workman so as to give the right task to each one, the director of the factory must know the capacity of his subordinates, so as not to assign duties to one incapable of performing them.

2. It is for this reason that it is necessary to define the nature of each department to be organized.
3. It will next be easy to indicate the necessary qualifications for the head of each department.

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4. When a supposedly suitable person for the position has been found, his rights and duties must be thoroughly explained to him.

   He must also know when he is permitted or required to use his own initiative, and when he must follow instructions exactly.

It is necessary to make sure that instructions are always properly followed, and to show short-comers, politely but firmly that any departure from the proper path will not be tolerated.

If the employees have any criticisms to make, the superiors should not listen to them with false pride but should be even grateful because they called attention to the matter, and avoided the commission of errors. However they must not be allowed to change orders on their own authority.

Rights and Duties of a Department Head

Once the department head is chosen by the management and the object of each department is determined, by agreement between the management and the department head, he should be

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given free hand as to the means of obtaining results, even if these means do not please the management.

It should be remembered that if there be only one end to be obtained, there are many possible ways of arriving there. It is, therefore, natural that the subordinate should often choose a different way than its management.

The management should therefore allow him to follow his own ideas freely, and help him to develop them as much as possible.

This is only just, since the subordinate in question is responsible for the results, and this condition, liberty of action, is indispensable for success.

If the management, while agreeing with a department head as to general principles, differ from him as to the methods to be used, and insist on its methods being followed, he should act as he is directed, since in this case the management evidently takes the responsibility for success or failure.

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It is to the failure to observe these principles, simple and logical as they are, that we must attribute, in most cases, the lack of success of a great number of industrial enterprises.

Some Reflections Concerning Employees In the Offices

I found that almost everywhere (in all countries of Europe, as well as America) an attempt has been made to secure a brilliant staff of officials (directors and engineers, etc.), but, on the contrary, the education of minor employees (superintendents, foremen, mechanics, etc.) has been more or less neglected.

This is a great error.

Just as in war, victory does not only depend on the general-in-chief, since he must be seconded by intelligent and courageous subordinates. Similarly, in the economic struggle the manager of a factory needs the help of a properly trained force.

I had very often the opportunity to make a close study of how everything is going on in commercial

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and technical offices, and have been able to observe that the majority of the employees of these offices does only a very small part of what each is capable, and even this small part in itself represents only some per cent. from what each could do if the employees were constantly *advised*, *guided* and *controlled*.

I know that advising and guiding is done, but only occasionally, and not methodically and not as long as it is necessary.

In other words, if we notice that some employees need to be controlled more than others, or advised, this should be done every day and according to a system.

Within a few years and in accordance with the theory of Dr. Frederic W. Taylor (world wide known engineer) special instructors are designated in factories with the sole purpose of teaching and guiding the workmen.

A similar system could be adopted in offices.

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Some General Remarks Concerning the Kind of Employees Encountered

In my opinion, there are three classes of employees to be considered:

1. Those who are intelligent and industrious;
2. Those who are of no value whatever.

   These are unwilling to learn, and can see no need of it; they depend on a pull, intrigue, flattery, etc., for success.

3. Those who lie between the two extremes—

   They are from the point of view of number, the most important of the three classes.

   They are neither very intelligent, nor very industrious, but are manageable. With a little tact we can arrive at a good result. By encouraging good work in one way or another (advancement, bonuses, compliments, etc.) a great improvement can be effected.

   In the case of rewards they should be immediate and not delayed for months.

   Since reprimands and punishment are immediate, why not rewards?

Conclusion

I will say that I find the first necessity is:

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1. To study the workmen and other employees more closely;
2. To keep the good ones and those capable of improvement;
3. To encourage by premiums or otherwise those who can be of value to the business;
4. To be severe with others, until they begin to show some improvement.

How to Select a Sub-foreman

What Should He Know, and What Are His Duties?

Let us consider now, as an illustration, some of the main positions in a factory and indicate the necessary qualities for the heads of these different positions.*

In many factories the management doesn't desire a complete re-organization, but is willing to improve parts of it. In this case my advice given hereafter concerning sub-foremen and foremen, etc., is useful.

*NOTE.—In some large factories there are to be found sub-foremen, foremen superintendents, general superintendents, factory manager, etc. While in some other factories of less importance are only foremen and superintendents, etc. Again in a concern where a complete system of a modern organization exists the duties of a foreman will be very different from those of a foreman in a small factory which is not organized.

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It is preferable to have at least a fair organization than none at all.

A sub-foreman is usually in charge of

1. The *making* of one or several parts; or
2. One or several different *operations;* or finally
3. The *assemblage* of some machine.

He is, therefore, in charge of several machines, some run by trained workmen and others by apprentices.

The sub-foreman must, therefore, oversee the men and advise those under his orders, keep track of their output and see that they are kept properly supplied with tools and materials.

Usually, the administration attaches but little importance (in any case, not enough) to the choice of a sub-foreman and to his methods of directing men. This question is usually considered, wrongly, as too unimportant to be worth serious consideration. The choice is left to the foreman, who usually chooses as sub-foreman a

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workman skilled in his trade and who is "energetic."

This is all very well, but not enough.

Once a workman is raised to a position of authority, he needs other qualities in addition to a knowledge of his trade.

The way sub-foremen do their work shows a confusion between energy and "roughness." The sub-foreman seems to be very energetic—in reality, he is merely rough. Most of the young men who work under his orders are not yet fully trained, neither in knowledge of the trade nor in character, therefore, to get the best results the sub-foreman must know how to deal with them. This is really a very delicate matter, as they can do as much as a regular mechanic provided they have special devices and proper supervision.

Here is a case of daily occurrence where apprentices are occupied in factories which repeat products in large quantities.

It happened that an apprentice has finished the work assigned to him. His machine is stopped,

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and he does not know what to do next. Accordingly, he sits and waits for further orders. The sub-foreman, however, may be busy with other machines, or he may not have provided the materials and tools for the next job; and the machinery has to wait until this is attended to. Thus both the machines and their operator produce nothing, and since the apprentice's pay continues as long as he is in the shop, the result is a dead loss to the company.

Remark: Simple devices are to be adopted to help the apprentices to correct faults of manufacture without needing to call the sub-foreman every minute. This is necessary because of the number of machines under his supervision, many of which might have stood idle for hours while he was busy repairing others.

If the repairs needed were serious the apprentice stopped it, so as not to turn out defective work. The sub-foreman is to give the men under his supervision clear and complete instructions, as if he were a teacher. He has to be told not to be rough with his subordinates (nor, for that matter,

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to be too lenient), and not to discharge them on his own account, especially without serious cause.

In case of infractions of rules or bad work, he should first speak to the offender; if this do no good, he should appeal to the superintendent, or if necessary, to the management. See special chapter on Discipline.

Duties of the Sub-Foreman
Jobs Prepared Ahead

In a factory where modern organization is not yet introduced the sub-foreman is also *supposed to prepare the work for each machine or each worker for a couple of days ahead.*

For this, he can be given a set of shelves, corresponding to the various machines and workers, and on each shelf he is to place beforehand the necessary tools, materials, drawings and patterns.

Consider a sub-foreman having charge of a large number of workmen and machines; if everything be prepared in advance, as I have explained, a few machines must of course be stopped from time to time, to change or sharpen the tools or

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to start a new job, but the other machines will go on without interruptions since everything is prepared in advance. Thus, the sub-foreman will be able to do his own work properly, without being constantly bothered. This would not be the case under the ordinary system; several machines would stop at once, one workman wanting raw materials, another, tools, a third, having a broken belt, etc. The loss from these sources is incredibly high.

The administration is in the habit of considering only matters that ***look*** *more important, and of neglecting real important questions of this kind.*

It is best to avoid entrusting sub-foremen with a lot of writing, drawings, books, etc. However, he must have the following information, particularly when articles are made in large quantities. Each of the machines should be numbered, and he should be told:

"This machine can turn out so many parts per hour under normal conditions; this one so many, etc." "If, at the end of the day, the full number have not been produced, you must be able to give

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a proper explanation, justifying the diminution of output."

The sub-foreman should keep track of the time when each of his subordinates begins a job, and the time he finishes it.

The Shop Foreman; How He is Chosen; What He Should Know; What He Has to Do

Ordinarily, a foreman is chosen by promoting the best workman or sub-foreman. The one who works the most conscientiously is selected unless the choice be made by *favor* ("pull") or other personal consideration.

Being a good workman is not enough to be a good foreman, he must also be energetic and a good leader of men.

A workman may be very competent in his own work without being fit to command others. Similarly, he might make a good foreman, without being a very skillful workman.

A good foreman should know just how each piece may be most advantageously made, and, if necessary, should be able to suggest improvements.

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He should know how to judge the quality of the work and should therefore accompany the sub-foreman when they make their quality inspection rounds.

The foreman himself will make other rounds, alone or in company with the factory manager, and also at fixed hours. He should be able to organize the work by distributing it so that each sub-foreman or workman has a task of which he is capable. He should, moreover, know how to arrange the work in advance, before the job under way is completed, and not have to wait until the last minute to ask for materials, drawings and instructions, leaving the men without work between jobs.

Every day the foreman should make out a program for the distribution of work several days ahead, so that in the morning when the shop opens, several men will not come to him at once to ask what they are to do next.

Each time they start work, in the morning or after lunch, he should place himself in the middle of

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his force and do nothing but see that they are at their places and start work on time.

It is most essential that he keep order among his subordinates. It is easy to prove that if the foreman lack the qualities I have just mentioned, the output suffers in consequence.

A foreman should have very little reading or writing to do, because he is usually uneducated or not trained to do clerical work, and this confuses him. Besides, since this writing takes up a great part of his time, he will be liable to use it as a pretext to remain constantly at his desk, and neglect his other duties. Tell him that the work is going badly, that the discipline is lax, that orders are delayed, etc., and he will always answer: "I have so much writing to do that I have no time for anything else."

He should therefore have no writing to do except:

1. To mark the time necessary to complete the work on each machine;
2. To note the name or number of the workman;
3. To note the number and nature of the order.

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All other writing should be done by the quantity and quality inspectors.

The foreman should be forbidden to remain at his desk, or to wander about the different departments under pretext of "looking for information."

In some factories the foreman in person gets the necessary materials.

In my opinion, this is a mistake, for if the work has been spoiled, it is easy for him to replace the materials without informing the management.

Supervision

Bulletin Board in a Small Factory

One thing must never be forgotten, namely, that anyone having the least authority, has his duties and responsibilities.

A good system of organization is one which allows every one to see at a glance what he has accomplished, and also what remains to be done.

Similarly, all those who have to see that others attend to their work properly must be able to

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see at a glance the exact state of the situation. It is for this reason that I advise giving each foreman a blackboard.

In the first column is to be painted the number of each workman; in the others he writes with chalk the numbers of the orders to be carried out.

Consider, for instance, the case of workman No. 1, and the first day of the week; we see that he has about four days' work to do on Order No. 310, and that the foreman has already provided work for him on order No. 817. In the column evidently of remarks, we see that tools are lacking; as soon as they are supplied the man can begin work on this order.

Bulletin Board for the Foreman's Use.

Workman No.	Monday Order No.	Tuesday Order No.	Wednesday Order No.	Thursday Order No.	Friday Order No.	Saturday Order No.	REMARKS
1	310	310	310	310	817	817	Tools lacking for No. 817
2	43	43	570	570	570	570	Send for drawings
3	914	914	781	781	781	781	Everything ready
4	390	...	...	...	...	...	
5	217	...	...	...	...	...	Nothing prepared
6	115	...	...	...	...	...	
7	415	415	415	...	...	...	
8	325	325	325	325	325	325	Everything ready
9	325	325	325	325	325	325	" "
10	670	670	670	670	670	670	" "

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Similar remarks made as to workman No. 2, can be made as for No. 1.

As for No. 3, we see there is no need to bother about him for a week at least, except to see that he is doing his work properly.

Nos. 4, 5, 6 and 7 have *only* their present tasks and nothing prepared ahead. It is, therefore, necessary to find work for them at once.

Moreover, the foreman should be made to explain how he committed this oversight, or allowed it to be committed, in case his assistant be in charge of this kind of duty.

Remark: When a chief is making an inquiry of this kind he must push it through to the end, that is, he must determine to what degree the system or the employees are at fault, and take measures in consequence.

The advantage of this blackboard is apparent to anyone, the foreman himself, the tool room clerk, or a representative of the management, may see, in passing, all that is lacking, and take the necessary measures to supply the want at the proper time.

To sum up, we may say that in every business, we should prepare similar blackboards, so as to give

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to every head of a department (foreman, sub-foreman, etc.) the habit of keeping the work prepared sufficiently in advance for everyone of the employees. This makes it possible to think matters out at one's ease, and take such action as *mature deliberation may suggest.*

Functions of a Factory Manager or Superintendent as the case may be

What is the exact definition of this title?

Of what does this function consist?

By definition: A factory manager is *simply a chief superintendent.*

He must work in the shops according to the orders of the technical direction, or Engineering department as the case may be. In no case, and on no pretext, should he assume the initiative.

If he consider, for example, that the instructions transmitted to him are not practical, it is not only his *right* but even his *duty* to call attention to the fact, and he should be encouraged in doing so, but he should in no case depart from these instructions on his own authority.

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According to the system we are now considering, all the orders are sent by the general office to that of the factory manager or superintendent. The latter in accordance with the data given to him by the bulletin board clerk fixes the date of delivery, assigns the work to the various shops so as to keep at least two weeks' work ahead for each, and makes out the requisitions for materials for the different shops according to the orders, and at the time they are given out.

In shops where the factory manager (or superintendent) himself makes the requisition for materials, it often happens that when he has defective parts, he procures additional material, so as to do the work over again without the knowledge of the management. Thus the latter is unable to assign the responsibility for the defective work.

If, however, the store room *only* deliver materials on the order of the general office, this cannot occur.

The office of the factory manager (or superintendent) will, moreover, tell the foreman *which*

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machine and *which workman* should execute each piece of work.

It is desirable that the office of the factory manager should contain:

1. The plans of all the shops with complete indications of the location of all machines.
2. Records concerning each of the machines (drills, planers, turret-lathes, etc.).

The records should show the usual types of work (for the industry in question) of which the machine is capable of giving the greatest possible output. They will allow the manager to determine the time necessary for the execution of the work.

3. A blackboard showing how work is progressing in the factory. (Program charts.)

The objective we must constantly strive to attain is, that

The manager should be able to see at a glance the progress of any given order.

The blackboard will save him any amount of trips to and fro, and much searching through the records of the factory.

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BUSINESS MEETINGS

What Is the Best Method of Conducting Meetings Between Bosses and Their Employees?

I advise the heads of industries, as well as their chief lieutenants (manager, department heads, superintendents, foremen, etc.) to hold as often as possible, conferences dealing with questions affecting their business.

These conferences should be held at least three times weekly between each executive and his immediate subordinates.

There should be no fixed place for holding them. They should be held sometimes in one place, sometimes in another. Neither should there be any set time.

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The executive should notify his subordinates by

telephone that they are to come at once to such and such a place to be present at a conference.

The workmen and the employees, in general, should not know the time and place of these conferences, so as not to be able to take advantage of the temporary absence of their chiefs to be idle, or even to do things that are contrary to the interests of the company.

The chairman of the meeting should do no more than *direct** them and should leave everyone at liberty to point out any defects he has noticed, and any improvements he has to propose.

The chief should never begin by criticising methods and the manner of acting of his subordinates, so as to show more clearly the advantages of the methods he wishes to propose.

It would be an unpardonable lack of tact which he would pay dearly for, as he risks wounding the vanity of his subordinates and thus provoke a hidden, but obstinate resistance, that will wreck all his best schemes.

*NOTE.—I insist on the word "*direct*" because I am convinced that the chiefs should be very careful to do ***no more*** than "*direct*."

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Practical Instance

To illustrate, let us consider the following case: It is intended to start the manufacture of a new piece or to improve the existing manufacturing methods. It is, therefore, necessary to know what is the best method of working and the most practical arrangements to adopt, so as to obtain the best results.

It is evident, that between a superintendent who has many questions of this kind to study, and the foreman who has only one (his own shop), the latter has evidently more time to devote to the matter.

Moreover, if the foreman have less technical knowledge or training than his superior, on the other hand, he is, far more familiar with certain practical details concerning the machines and methods of his own shop, and may thus become valuable aid, if we know how to make use of him.

If the superintendent begin by proving to the foreman, particularly in presence of his equals, that he has been making mistakes, the latter will be offended at once.

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Though the chief may propose after this the most ingenious methods, the foreman will not listen to him; or, if he do, it will be only for the purpose of finding the weak points of the methods proposed.

We may, moreover, be sure that the foreman will do everything he can to make these methods a failure, so as to prove that the chief is no more able than himself.

I am convinced, that, in most cases, the *manner* in which a system is introduced is as important as the *value* of the system itself.

Thus the success or failure of a system depends *at the same time* from its *manner* as well as from its *value.*

I, therefore, suggest that each time there be a question to solve, the chief begin by asking his subordinates to explain the faults that he himself has found, and to indicate the improvements the subordinates propose.

When the chief sees that a subordinate does not fully understand the question, he should gently

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call his attention to the weak points of his argument. He may ask him to look into these points before the next conference.

Meanwhile, he will give him, in a *casual way*, some ideas on the manner of looking it up, without insisting too much on them and above all, making these ideas appear to come from the subordinate, and not from himself.

We must be careful of the vanity of our subordinates even more than that of our superiors.

By acting thus, the chief may be sure that in this case the foreman will do his best in properly applying the solution adopted, so as to obtain the best results.

He will do this all the more quickly and better in case the chief has taken care to *interest him* in *the results obtained*, not only *intellectually* by compliments, but also *materially*.

Remark

It is only human nature that the chief should want the credit for the practical improvements he has introduced; but as for this he need have no fear.

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The other subordinates who are at the conference are witnesses of what has happened, and they will be sure to tell anybody if a good result were obtained, it is due, not to their colleague, but to the chief.

They say: "It is all due to the 'boss' that this was done, because he was the one who gave the good ideas."

We should not forget that *men are far more jealous of the merits of their* ***colleagues*** *than those of their* ***chief.***

If they have to choose between attributing a success of any kind to their chief or to their comrade, the chief is sure to have the preference.

Each person present at the conference should have a note book and pencil ready for use, and should record all the orders and instructions the chief gives him.

As soon as the conference is over, he should proceed at once to put these instructions into execution, or at least, he should do what he can to see that the execution is begun.

Thus numerous causes of friction could be avoided between the chief and his staff, on account

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of the fact that the latter have forgotten the orders given them, or have delayed in carrying them out.

If, in all sincerity, the chiefs find that their subordinates be right, they should admit it at once without evasion.

I know by experience that this is by far the best method. The chief may be certain that this will be to his interest.

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REFERENCES

References Asked From Employees When They Apply For Positions

Some Thought About the Utility of These References

It is very interesting to notice how the *doings* and *sayings* of even *the most intelligent men* are, in many cases *meaningless* and *even harmful.*

If one take the trouble to observe the matter, it would not be difficult for him to see that this is very often the case.

They do this mechanically because everybody is doing it; their father has done so, their neighbor is doing similarly now and they simply continue in the same manner and that's all.

Sometimes the results are more harmful and sometimes less, but they are always at best unprofitable.

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We will take the case of a concern which desires to engage an employee.

What should the concern know about the candidate?

1. It should be ascertained whether of course the employee know his trade.
2. If he be honest, and
3. What is his character, temperament, etc.?

On the other hand it is very easy for the employer, provided that he know his business, to judge the knowledge of the applicant in a very short time. A quarter of an hour is amply sufficient to have a pretty good idea of what an applicant knows.

At any event, a few days or a week is more than necessary for the purpose in question.

By means of a similar trial the most definite opinion could be found about his knowledge of his trade. At any rate it will be better than to rely solely upon the information given by concerns or "prominent" people expressed in certificates or by means of telephone conversation.

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Concerning Honesty of the Employee

If it be a question of employment of a *cashier*, *purchasing agent* (or of similar positions) where honesty is required, then *special care* has to be taken. But, generally, it is not necessary to have special references.

Why?

Because an ordinary human being is at least always "reasonably honest." This means he will not steal, not because of his conscience bothering him too much, but because he is afraid to go to jail, or especially to lose his position, and be despised by his fellow workers.

Thus, if steps be taken by the employer to control everything and to put anything of value under lock, he will not try to break the lock or to take things which do not belong to him.

To illustrate: Suppose that a concern wants to engage a draftsman or a stenographer, it is in my opinion, not necessary to attribute *too much* importance to the question of "honesty." They have no money or checks of the company to handle or sign.

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If there be some valuable documents in the drawing room or somewhere in the office, it would be foolishness on the part of the employer to leave them lying all over.

Concerning Temperament, Character, Etc., of Employees

Here, also, I believe that the information asked by concerns or taken through special references, is not necessary and does not give the results desired.

Except in very special cases, employees are such as their superiors make them.

In some factories, as I have seen, all employees live in complete harmony, even in friendship. They esteem their employers. When a newly engaged employee comes in, he feels at once the "temperature of the atmosphere" and he will do his best to fit in at once. While in other factories a newcomer, from the first moment he is in the office, feels that he is in a place where everybody walks as if it were on a volcano. Distrust, hate, injustice, etc., prevail everywhere.

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From the first moment the newcomer is informed directly by his fellow workers about the "insolence" of one and the "ignorance" of another, the "injustice" of such and such an employer or of the company, etc., etc.

The newcomer, even if he should be provided with the best character in the world, would not be able to resist the main current. He will be dragged in the same path as the others. *It would not last a long time before he, himself, will* ***think*** *and* ***act*** *just as the others do.*

About the Meaninglessness of References Demanded by Employers

Let us see now how things are really going on in the industrial world. When an employee offers his services to a concern, the latter asks him, "Who can recommend you?"

Of course, the word "who" means: "What prominent man or well known concern?" If one stop to think a little, he will find that this question is *meaningless.*

"Why?"

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An illustration will better explain my ideas.

Suppose the employee be either a store keeper, a draftsman, or an engineer. He meets mostly in business, *socially* and **intimately** the same kind of people as himself.

> For instance engineers will most of the time be in touch with other engineers; draftsmen with other draftsmen; and store keepers with other store keepers.

Even when they sometimes meet people belonging to other trades, lawyers, physicians, artists, etc., all of them are standing socially on the same steps of the ladder. On the other hand, it is true that the store keeper or the draftsman will *occasionally* meet a banker or a prominent manufacturer or some military celebrity, but that's all. In general they do not care about each other, they are of different classes, who have not the same interests, the same views, the same feelings, etc. Thus they do not understand each other.

Now, this being the case, if we wanted to know something about the *real* manner of *acting* or *thinking*, etc., of the draftsman or the store

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keeper or engineer, we *will rather have to ask information from people with whom he deals constantly and intimately.*

Why?

They are in a better position to know everything about this man, while on the other hand we would be unable to learn anything from a banker or another "prominent" man who (as I said before) doesn't know him *so well.*

And yet, when the company asks references from the prospective employee, it prefers that the applicant present a recommendation from some "prominent" man or a well known concern.

How do Companies Proceed when they Engage Employees?

Most of the time they give him a blank to fill out. In this blank the applicant is to indicate several addresses where he was previously in service. The company asks for confidential information. According to answers received, the employee is engaged or he receives a letter which usually begins with the *standard* sentence, "We regret to inform, etc."

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What is the significance of this?

It means, that, before the facts are known, the company believes more the statements made by another concern than those made by the employee himself; moreover, it believes more the word of a concern, *even* if it know *nothing* about it.

Generally it is taken for granted that the information given by a concern is *first of all*, supposed to be sincere, impartial and hence trustworthy. While on the other hand, it is taken for granted also that an employee is *first of all*, not to be trusted. Still, there are *good and bad* companies, good and bad "bosses," or, finally, a good or bad system of management, just as there are good and bad employees. . . .

It is *not always* the fault of the employee if he did not make good at the previous position (according to the statement made by the concern).

In some cases even it is the fault of the official under whom the employee is working. In fact, the official himself is often incapable of handling his

employees or of making himself, if not liked, at least esteemed.

Again it is very often the case that the employee is entrusted with duties for which he is not fitted either by his school education or temperament. In this case *who* should be made responsible if not the superior himself. Since it is he who *ought to be able to know the capabilities of his subordinates, and to give them a job which they* ***understand, like,*** *and are* ***able*** *to fulfill.*

In a word, if the employee did not succeed in one or more positions, this does not always mean that he will not be able to give the best results should he be placed in the right atmospheric conditions and circumstances.

It often happens that the head of a department hates one of the employees in case he show some independence and like to reason and ask "why" and "wherefore." He is pitilessly discharged and unfavorable information is given about him. Faults of this kind do not appeal to every head

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of a department. Some of them like their employees to execute their orders *blindly*.

The head of a department of a similar type doesn't even care how the execution is done; the main thing is that the employees do as they are ordered.

Suppose now that the same head of the department be requested to give information about the employee that he dislikes so much. Is it necessary to possess a large imagination to surmise the kind of information he will give?

How References are Given by Big Companies About Their Employees

"If the reader knew how references given by concerns about employees are manufactured," he will understand my feeling about the *value* and *justice* of same.

If it be a question of asking information about a "high official" who left the company, the general manager, or the president himself is able to give his personal opinion (in case they had the opportunity to be constantly in touch with him),

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but when the question is about a *minor* employee, usually the president or the general manager himself does not have the slightest knowledge about him, and yet, *it is these men who give the reference.*

How do they do it?

They ask information from the head of the department under the supervision of whom the employee has been in service, and information given by the latter is transmitted *confidentially* to the concern who asks same. As I said before, the opinion given by the head of the department is not always to be considered as being very *serious* and *unattackable.* Better than this, sometimes the head of the department himself ought to be made responsible for the very things for which he reproaches his subordinates.

The misfortune is that the bad information is transmitted from one concern to another, no one takes the trouble to check it up. Thus, a bad reputation is unjustly made for the employee, and yet, if superiors knew how to make use of these "faults" in using some tact, patience, and justice,

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they could have obtained the best results from the kind of employees they hate so much.

For the majority of cases, the results obtained will be even *far better* than those given by the "good" employee.

A *striking instance* is given by the French foreign legion.

1. It is the members of this legion who are credited with *the most daring* and profitable *exploits*. Whenever and wherever the commander is not very sure that even his best troops will succeed, he generally puts his last hopes on the foreign legion.
2. Everybody knows that the officer under the *direct* supervision of which are placed the legioners are splendid *leaders*. They know how to handle men. The industrial world is ***full*** of the *same type* of men as the foreign legion member.
3. Most of the time they become "failures." The responsibility of this is to bring back to the door of the employers who *do not know how* to make use of the splendid "faults" of same subordinates.

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Remark No. 1.

To check up my theory I made the following experiment. I engaged on trial some men about whom I had unfavorable "confidential" information. I was told, for instance: This young man is very intelligent, hard worker, honest, but—he is impossible in character, hard headed, or unreliable, etc." Well! precisely with these kind of employees I had the best results.

How ?

I took the trouble ***to study them as closely as possible*** and tried to give them jobs according to their ***knowledge, temperament*** and ***tastes.***

I tried to make them have confidence not only in themselves, but also in me. I encouraged them by every means, and noticed that at the beginning they hesitated to believe in my sincerity.

They have not been accustomed to be treated in this manner, but once they felt that I meant well with them, I obtained their full co-operation, thus I was able to obtain everything which could be ***reasonably*** *expected from human beings.*

Was this very hard to do?

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Not at all, in fact. In a technical or commercial office there is a big choice of different kinds of duties. Some of them, for instance, are to be done outside, some, on the contrary, in-doors.

Again some of the duties require a liking for detail work, while others do not require this, etc.

Suppose now, to illustrate, that I have at my disposal fifty employees. Why shouldn't I try to give every man a job according to his abilities and likes?

We find it natural for a man, when he wants to buy a suit, to go into a clothing store and choose the suit *according to his stature.* Why, similarly, should we not give work to everybody according to his knowledge, temperament, etc.

Remark No. 2.

I will add to my previous explanation, and say, it happens that an employer stated he was satisfied to accept any reference given to him by the applicant for a position. Even in this case, I claim it meaningless.

Why?

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Because it is not to be expected that the employee will indicate as reference, men who don't know him, or who are indifferent to him.

It would be of no use for him to do so, and it is still less to be expected that he should give as reference his enemies, since they would not recommend him favorably.

He, undoubtedly, will indicate his *friends* who will give the best opinion of him even when he does not deserve it.

In fact everyone knows that in the majority of cases it is the most incapable men who succeed in providing themselves with the best credentials, just the same as dishonest people (more than the trustworthy) are careful *to be always* provided with the best "identification" papers.

Remark No. 3.

If we have still to consider the above problem from other angles we have to add the following:

In some factories they are beginning to recognize the superiority of a personal trial over the system

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of references, but the manner in which they are doing it is not the right one.

Thus it does not give the results which could be expected.

As illustration I will cite the following example:

A works manager applied for a position in a large factory. While he was talking with the president of the company he offered to show his credentials and to give him references.

The president answered: "I don't care for credentials and references, I do not believe in them."

The works manager who was himself of the same opinion as the president thought: "It is the first time in my life that I have heard an intelligent statement."

The works manager had been invited to call at the factory, but instead of being put on trial, and *examined by the president himself*, he was introduced to the foreman, superintendent, tool designer, and still other *minor* officials. Every one of these officials was instructed by the president

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to report to him, "their opinion" of the applicant for the position!

The president himself *did not spend a minute to* check up the statements made by the works manager concerning his abilities.

As one can understand, the role has been just reversed.

In fact, if the president had acted as he should have done, he would have requested the "applicant" to investigate conditions in the factory, to cross-examine some officials, as, for instance, the superintendent, foremen, etc., to come back to his office and give *his* opinions about everything he saw; thus, the president could be able to see if the applicant were *capable of seeing things as they are, judging them correctly, and remedying where necessary.*

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TRAINING OF EMPLOYEES

Reducing Cost of Preliminary Instructions For Office Employees and Apprentices Working in Factories, Particularly Those Manufacturing Stock Articles

By way of practical examples, let me cite the following cases:

1. Offices of an important company manufacturing pocket handkerchiefs.
2. Factories of an equally important company making screws for wood and metal, hinges, bolts, nuts, and the machines for their manufacture.

Office Force

1. Newly engaged employees.
2. Old employees.
3. Long and expensive apprenticeship.

**NOTE.—There is evidently no plausible reason why all that is true in these two cases should not be equally true for the offices and shops of railroads, exporters, department stores, etc.*

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4. Poor results from the work.
5. Reflections on the causes.
6. Remedies suggested.

Generalities

Let us consider the ***office force*** of an ***enterprise of any kind.***

We will find that even in offices which are well organized and where the output of the force is considerable, that is, where the clerks work quickly and well (although this case is really quite rare), we will find two distinct classes of employees:

1. Those who *understand reasonably well* the nature of their work and
2. Those who work *mechanically.*

It is evident that the greater the number of the latter type, the greater the loss due to mistakes, and also to the lack of such practical ideas as would naturally occur to them if proper measures had been taken to make them understand what they were doing.

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Consider first the new employees. Here the affair goes altogether badly. It takes months before they have a general idea (and not even a very complete one) of what they ought to know. They *hardly ever know passably well the duties of their position.*

Why?

If you ask the newly engaged clerks (as I have done in the offices in question) they will explain it fairly enough. They will speak somewhat as follows:

"We had the greatest trouble before understanding in the least the nature of our work."

"This is natural enough because the business is very complicated, so that every day questions arise which vary greatly, both as to the nature of the raw materials, and as to the type, style, color, etc., of the finished product. (See details below.)

"This is reason enough why it is difficult to understand the work in a short time, but, in addition, you must understand that all the definitions,

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denominations, schemes, tables, etc., are altogether lacking in clearness, precision, and uniformity, so that we new clerks must be continually asking explanation of our associates and our superiors. But you will readily understand that one seldom finds two persons who attribute the same significance to the same definition or denomination. And besides (as anyone can easily see), the *employees, with but very few exceptions, are incapable of giving an explanation that is clear, simple and logical, so that a newcomer can quickly understand what he needs to know.*

"They begin their explanations at any point, sometimes in the middle, sometimes at the end, but ***never*** *as they ought to.* Very often they give signs of impatience if we don't grasp at once their explanations."*

*NOTE.—I know this to be absolutely correct, having made the experiment in the following manner: In trying to study the existing organization, before suggesting any new methods, I questioned all the chiefs of the factory, as well as the employees. I found, although everyone was glad to help me by answering all my questions, although I made the greatest effort to grasp the explanations, and although I have far more experience than the average young clerk, I had the greatest difficulty in understanding, from the explanations given me, the working of the existing system. Now, if it were difficult for me to understand, is it remarkable that a very young person, newly engaged, has still more difficulties, which may seem almost unsurmountable? It is all the less astonishing when one thinks that these young persons, for lack of any real knowledge, or any great experience, have only their youth to offer to their employers. Valuable as this is in many ways, it is of little use for the purpose in question.

Since the work is complicated and uninteresting, it is no wonder that instead of showing a fondness for their work, the new clerks find their greatest interest in watching the clock and waiting for closing time."

In summing up we may say: *The new employees require altogether too much time in becoming familiar with their work, hence there is a considerable loss of time and money.*

They are not sufficiently familiar with either the "why" or the "how" of what they are doing. They work mechanically and cannot help making mistakes. Thus one loses all the good effects of their natural initiative and cleverness, of which we could have made use of if we had tried to develop these qualities in them.

Considering that the *value* of the services of the employees, as well as the *length* of their apprenticeship depends greatly on the *quality* of these *definitions* and *schemes*, the *arrangements of tables*, *disposition of columns*, *terminology*, *etc.*, used in an important business, I consider it

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absolutely essential to have not only a perfect organization as to the lists and tables, but above all a routine, including explanations, schemes, definitions, etc., that is perfectly clear and simple.

Leaving aside generalities, let us now consider some practical cases. This will make it clearer how trifling stupidities that one would hardly think worthy of consideration may produce most important effects.

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FIRST PRACTICAL EXAMPLE

Offices of a Handkerchief Factory

Some time ago a new system of methodical organization (the celebrated "Taylor" system) was introduced in this factory by a Mr. "H," the favorite disciple of Dr. Fr. Taylor himself.

I was sent with the purpose in view:

1. To investigate all the points that might obscure, complicate, and consequently delay the proper march of the entire system of reorganization.
2. To see if all the means of transportation, machinery, and all the other apparatus used in manufacturing was working at its maximum efficiency.
3. To indicate, if possible, the means to be used in remedying the state of affairs, in case this maximum was not attained.

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In order to show the importance of what is to follow, I consider it necessary to say a few words about this special type of work (the manufacture of pocket handkerchiefs).

The public generally thinks (as I myself did) that the making of handkerchiefs is very simple. As a matter of fact, the contrary is the case.

What are the differences existing among the various sorts of handkerchiefs?

They differ in the following respects:

1. The *nature* of the material
   Cotton, linen, silk, etc.
2. The *quality* of a given material
   Number of threads per inch, weight per square inch.
3. The *size* of each handkerchief
   For men, women or children.
4. The *width* of the borders.
5. The *color* of these *borders*.
6. The *color* of the *handkerchief itself*
   Red, blue, etc., solid or mixed colors.

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7. The *embroidery*
   Type, design, color, number of repetitions on each handkerchief. There are certainly over 1,000 varieties.
8. The *printing*
   Various designs and colors.
   Here also there are hundreds of varieties.
9. The *folding*
   There are about 300 ways of folding a handkerchief.
10. The *packing number* in each box, dozens or parts of dozens.
11. The *initials* on each handkerchief.
    These vary in style, shape, color, size, etc. A single handkerchief may also have one, two or more initials in its corners.
12. The *ribbon* tied around the packages of handkerchiefs.
    This may be of various colors and widths.
13. The *boxes* for packing.
    These vary both in area and in height.
14. The *pictures* pasted on the boxes.
    There are thousands of varieties.
15. The *labels*, of various shapes, kinds, sizes, colors, etc.

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If you remember also that each customer has his preferences, and his own name for things, and that a single order must often be shipped in several parts at different times, you will not be astonished to learn that there are over one hundred thousand different cases that may present themselves in this business.

You will therefore understand readily why the manufacturing process and its organization are complicated. One must spend a great deal of time, patience, and energy, and a great deal of money, too (and this is perhaps the most essential) in order to maintain an organization that runs smoothly and well.

Let us now consider *how* the offices of this factory work.

I began my study with the office force. There were about a hundred office employees of both sexes and all ages. *Some of them worked hard, not because they were forced to, but because they were willing, being naturally active and ambitious. But the others did little or nothing, and nobody took the trouble to awaken and stimulate*

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the valuable qualities which they might possess, but which lay dormant.

The output of all this force struck me as very mediocre. It seemed to me also, that in spite of the excellence of the system employed, something was interfering with its proper working, but, *how* and in *what way?*

The closer I observed, the more I became convinced that something of this kind was going on, and my *supposition* became finally a *certainty.*

For reasons that I shall explain in the course of my study, I decided to go fully into the details of the question.

I remembered what I had seen in numerous other businesses that I had examined, and I concluded that *this state of affairs is general and frequent.*

Observations

Let me now review several cases that I have observed.

Each time I cite one I shall indicate what is wrong, so as to corroborate the statements I have made.

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The following explanation is necessary in order to render more comprehensible the reasoning which is to come later.

The main office, which attended to getting orders, is not in the same town as the factory. It sends its orders to the latter by hundreds daily. These orders are written on stock forms. As shown in fig. 12.

The employees of the factory had to copy them on other sheets of different colors and sizes, fig. 13, after having added certain extra information necessary for the factory. This was taken from certain cards known as "information cards," fig. 14.

I shall for the present, criticize this method which existed in these offices *before* the introduction of the new (Taylor) system, by merely showing how it worked.

Now if care had been taken to have the columns in these different forms of the *same widths* and arranged in the *same order*, as well as with the same order of letters, A, B, C, etc., see figs. 15, 16 and 17, the employees would have had no

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difficulty in copying the information from Form fig. 12, without risk or error.

They would only have needed to place the corresponding columns one above the other, as shown in the figures.

But as the width and order of the columns, and the order of the letters A, B, C, was by no means the same (see form figs. 12 to 14) it is no wonder that the work went slowly, and that errors were inevitable.

Under A, B, C, etc. we of course must understand various headings such as for instance: A-Silk Handkerchief; B-½" Seam, C-Packed per dozen, etc.

These seem to be small matters, it is true. Nevertheless, they were the cause of constant trouble, particularly if the following facts be considered:

1. In the forms where the *same objects* should be entered, the corresponding columns were missing, sometimes in one form, sometimes in another. (Printer's or somebody else's error.)
2. The same objects were called by different names, for no reason at all.
3. Certain information was written in columns intended for quite a different use.

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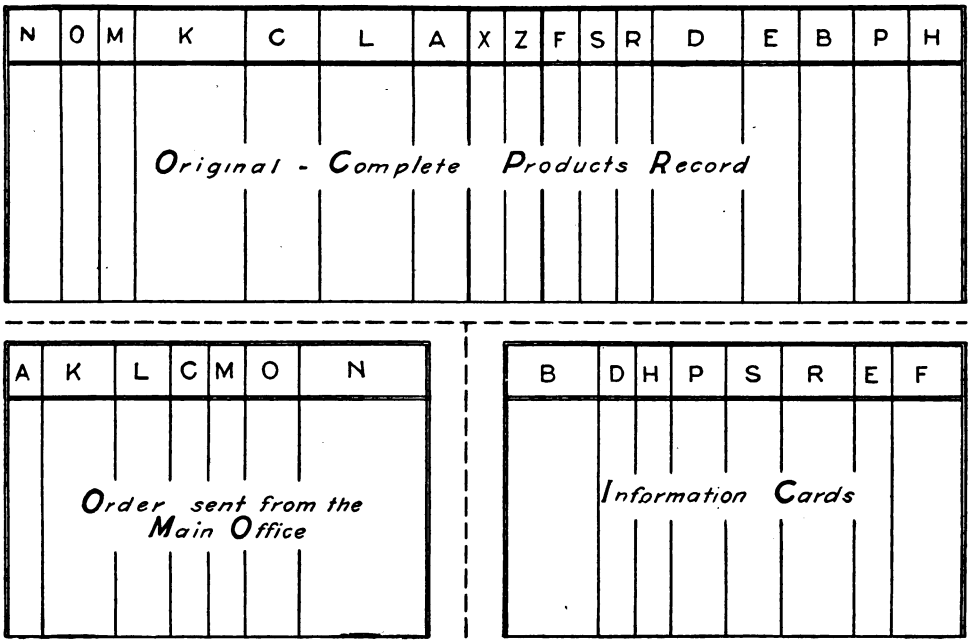
N O M K C L A X Z F S R D E B P H
Original - Complete Products Record
A K L C M O N
Order sent from the Main Office
B D H P S R E F
Information Cards

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FIG. 12.—Form for shop orders. The headings A,K,L, etc., were not explicit, width of the column not adequate.
FIG. 13.—Form for miscellaneous information which the employees had to consult where to interpret fig. 12.
FIG. 14.—Products record. This form shows the *ensemble* of information pertaining to a given item to be manufactured. Information from figs. 12 and 13 has to be copied on fig. 14 and it will be noted that the same order and width of columns does not exist.

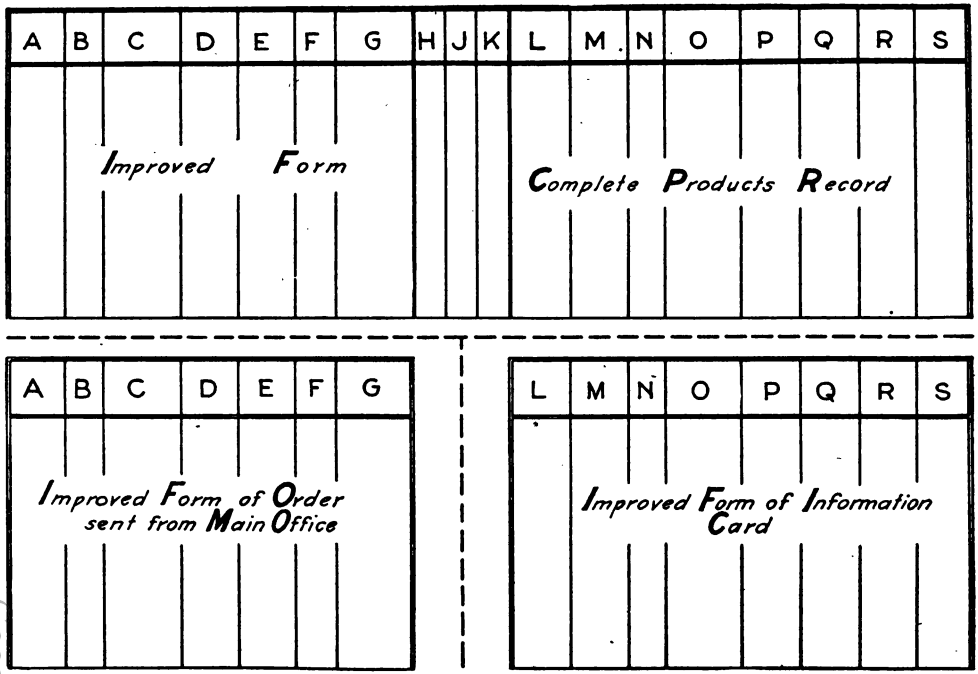
A B C D E F G H J K L M N O P Q R S
Improved Form
Complete Products Record
A B C D E F G
Improved Form of Order sent from Main Office
L M N O P Q R S
Improved Form of Information Card

FIG. 15.—Improved form for fig. 12.
FIG. 16.—Improved form for fig. 13.
FIG. 17.—Improved form for fig. 14.

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For instance, in a column marked "Men's handkerchiefs," one would find the date of delivery, or the number of boxes.

4. The employees lost a great deal of time in tedious hunting through *different sources of information.*

   There is no reason why this information could not have been grouped and co-ordinated on a single card.

5. Each form contained several different kinds of information, coming from different departments.

   While some departments checked their work, as shown by the attached signatures, others neglected to do this. Thus many errors were not found out until much too late.

   Why was not all the work checked?

6. When two employees are engaged in copying, *only one* of them signs the work.

   But the one who reads may just as well make mistakes as the one who listens and writes.

   How then is anyone to know who is responsible?

   Of what use is it to have only the one signature?

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7. Some of the column headings have *no meaning whatever*. For instance: "Our No.," "Style," "Call No.," "Special No.," etc.

These headings mean nothing, not only to an outsider, but even to the employees themselves. This leads therefore to confusion.

In my opinion one should always remember the following principle: When a column heading is adopted, it should be such as to call at once to the mind of the clerk the kind of thing to be written there. In this case there is little danger of mistakes.

For instance, the headings given in fig. 18 are more precise than those in fig. 19. The addition of sub-headings, as in fig. 20, makes them nearer complete.

What will happen if we use form fig. 19?

The employee will always find himself obliged to ask for an explanation so as to find out "What price?" "What time?" "What length?" etc., he should write in each column.

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$	HOURS	FEET	RED	IRON	

PRICE	TIME	LENGTHS	COLOR	METAL	

PRICE		TIME		LENGTH		COLOR		METAL		
$	¢	HRS.	MIN.	FT.	IN.	RED	BLUE	IRON	BRASS	

FIGS. 18 to 20.—Miscellaneous cards giving the difference between precise and careless heading of columns.

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However, if form, fig. 20, be used, even a new employee will have no trouble, and he will not need to bother anyone in order to ask for information.

8. I have asked *several* of the employees to explain to me the *exact meaning of certain terms*, and *no two of them ever gave me the same answer.*

   Even worse, the same person after a few days' interval, gave me quite a different answer than before.

   Is it remarkable after this, that a newly engaged clerk makes a great many mistakes?

   On the contrary it would be remarkable if he did not. And if he be very conscientious he will waste his time and that of others in asking for frequent explanations, and in tiresome discussions on the meaning of this and that.

9. I wished to have a sample of each type of handkerchief made in the factory.

   I asked who could attend to this. I was told that there was *only one person in the factory* who could help me in the matter, a Miss X. I explained to her what I wanted, and she began at once to look up the information.

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I observed the kinds of documents that she had at her disposition, and also her manner of using them. I found that she had to consult a large number of books, as well as many loose sheets. Some of these sheets were written on the machine, others by hand; some were in pencil, others in ink; some of them were at least written *legibly* (if not systematically) but a great many were scribbled hastily in a hand that one could scarcely make out, but what struck me above all was that she used mainly her *memory*, which by the way, was most remarkable.

But if one may compliment her on her excellent memory, one can hardly do as much for those who instituted the system in use.

As to the value of the documents in question. The important information, needed for constant use, was mixed with other things that were no longer of value. And it was only Miss X and perhaps a few other employees who could tell which was which.

What would then have happened, one may well ask, if Miss X had been obliged to stay at home for a few days?

Who could take her place, and furnish information to those who needed it?

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Now a fundamental principle of good common sense is that the *best system is the one where the regular working* (whether part or of the whole business) *does not depend in any way on the memory of "old hands" nor on the special knowledge or ability of any individual.*

I might cite hundreds of similar examples, but what is the use? They are all very much alike, no matter in what country they may be found.

I think that these few examples are enough to show the *vast importance that should properly be attributed to "small" details*, usually regarded as insignificant, and the absolute necessity of doing something to remedy this state of affairs.

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Instructors and Inspectors in Offices and Shops

The Necessity of Introducing in the Offices as well as the Factories of every Industry Instructors for the Clerks and Workmen, Particularly Those Newly Engaged

The system that I propose is one of daily tours of inspection and instruction, not only in the shops, but in the offices as well.

I know that some factories have already introduced inspectors to pass on the *quality* of the finished product. I know equally well that the wonderful Taylor system calls for the use of an inspector or an instructor, whose task it is to teach the workmen the methods to be used in doing their work quicker, better, and more easily.

But, on the other hand, I am certain that *nobody* has ever suggested the use of instructors for the office force.

Why?

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1. Is the work of a clerk generally more simple, and consequently easier to learn than that of a mechanic?
2. Is a clerk less liable to errors, and are the consequences of his errors less important than those which the mechanics make?
3. Are clerks more industrious and more devoted to the interests of their employers than mechanics?
4. Is the clerk less exploited by many employers and companies, and is his financial status generally any better than that of a mechanic?

Frankly, I cannot see concerning these instances any difference, no matter how slight. This being the case, I feel that I have a right to ask why it has been thought necessary to have inspectors, and sometimes even instructors, for the mechanics, and none for the clerks.

I can even go farther, and say that most of those who have followed the ideas of Taylor, the originator of the system, in introducing these instructors, have occupied themselves rather with the *form* than the *substance*.

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I have had occasion to observe the manner of giving "explanations" adopted by these instructors, and have found it altogether defective. This has proven to me that it is *not enough to know one's trade, in order to teach it to others.*

To ***know*** is one thing, but to know **how *to teach*** is a different thing.

To be sure, an entirely ideal person for an instructor is the one having both qualities, namely:

1. That of being able to work very well himself.
2. That of being able to explain equally well the best working methods.

But in any case, if I had to choose between

1. Someone who knows his trade *better* than he could explain it, and
2. Another who was less proficient as a workman, but was gifted in giving explanations, I should not hesitate an instant to decide in favor of the latter.

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Duties of Instructors for the Office Force

1. The instructors for the office force should be provided with complete information and all necessary graphic charts, to render the working and the supervision of each branch simple, clear, and easy to understand, particularly for the new employees.

2. The *manner* in which an instructor goes about his work should be carefully followed.

> If the ***definitions*** should always be the same, on the other hand, the ***manner*** which the instructor should use, in order that they may be grasped and retained, must necessarily vary, according to the nature, character, and mentality of each individual who is to be taught.

3. The tours of inspection and instruction should take place at least once a day.

4. As far as possible the same work should always be done by the same employee.

5. The employee should be taught *how* and *why* he is to do each thing, as well as the *approximate time* that a piece of work should take.

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6. The inspector or instructor, each time he checks up an employee's work, will ask to see the quantity of work that he has done since the last inspection. He will also ask him *how* and *why* he has done this or that. He will above all notice how the employees write figures, and finally:

7. He may, here and there, allow ***letters*** to be written more or less illegibly, but *illegible* ***figures*** *must not be tolerated, as they are certain to cause all sorts of trouble.*

SECOND PRACTICAL EXAMPLE

Shops Manufacturing Screws (for Wood and Metal), Hinges, Rivets, Bolts, Etc.

The screws are turned out by automatic machines, tended by young girls, each of whom has charge of about ten or fifteen machines. Each group (from five to ten girls) is operating under the orders of a sub-foreman, whose duties were:

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1. To oversee the quality of the work,
2. To instruct the girls in their duties,
3. To adjust the machines, sharpen the tools, and
4. To execute minor repairs.

As the force was constantly changing, and it was necessary to keep a reserve force of girls, new ones were being hired almost daily.

These were placed alongside those who had some experience, so that they could learn the nature of the work. By this method it took them months to learn the trade, and even then they were not very brilliant.

This is not surprising after all.

Because it is well known that the mentality and previous training of the type of girls that take up this kind of work leaves much to be desired, and yet I am sure that with the help of clear, precise, systematic explanations and the

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use of appropriate devices, we could have taught them all they needed to know in a couple of weeks.

But (there is always a "but").

It was certainly not the existing staff of foremen and their aides who could give them the necessary explanations, since they were not trained for similar duties.

This state of affairs has led everything in a vicious circle, which can be explained by the fact that the girls, as long as they could not run the machines themselves, were considered as *apprentices*, and received only a very small wage; the result was that:

These girls, seeing that it takes a long time before they are able to earn reasonable wages, become discouraged and leave the factory. This loss of time and money, corresponds to the ***cost*** of their ***apprenticeship*** and to the ***value*** of the good work they *could have* done *IF* they had known their trade.

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The whole thing had to be constantly begun over again, with a new lot of girls.

As there were hundreds of girls employed in this factory, one can easily see how great was the loss to the owners.

By way of experiment I asked the foreman to give the necessary explanations to the girls whenever this was possible. I was thus able to see for myself that these explanations were deficient, and their value almost negligible.

I saw that they were unnecessarily rude to the girls when the latter did not quickly understand, and that they often asked their dismissal on the ground that they were too "stupid" to learn anything.

After having carefully observed this state of affairs I decided to adopt the following measures:

Every day, and even several times a day, the foreman was to go from one girl to another, to look over her work and make sure that it checked with the models and drawings. These tours were to be made at fixed hours so that one could be

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sure they were really made. The foreman was to question the girls, so as to see if they understood what they were doing.

They were to take the pieces they had just made, and criticize their merits and defects. If the pieces were defective, they were made to point out not only what was wrong, but how to correct it.

How I Trained My Foremen

I was present almost every day, when the foremen made their inspection tours. I taught each foreman how to give the girls clear and precise explanations, as if he were a teacher himself, and not to lose patience if they were slow in comprehending what he meant.

Pointing out an apprentice here and there, I asked him:

"How is she working today?"

"What has she done since this morning?"

"How much is she capable of turning out?"

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"Do you find her work satisfactory?"

"How much does she spoil?"

"How much work has she ahead of her?"

"What has she to do after that is finished?" etc., etc.

I naturally tried to see whether the answers were correct, or at least if they were made in *good faith*.

These are about all questions that the foreman can easily be familiar with. If he make his tour several times a day, he will easily acquire the habit of answering correctly any questions of this sort.

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IS OVERTIME WORK EFFICIENT?

Nearly Everyone Has False Ideas About Overtime

Charles Schwab's Fondness for Overtime

How to Efficiently Train Office Force

There is a choice to be made between two systems:

1. Working *overtime*, and,
2. Working with *interest* or even with *enthusiasm* during usual shop and office hours.

First Instance

The following quotations are from Schwab's book, "Succeeding With What You Have."

"I have yet to hear of an instance where misfortune hit a man because he worked *overtime*. I know lots of instances where it hit men who did not."

"The man who fails to give fair service during the hours for which he is paid is dishonest. The man

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who is not willing to give more than this is foolish."

"When I took charge of the Carnegie works at Homestead there was a young chap employed there as water boy. A little later he became a clerk.

"I had a habit of going over the works at unusual hours to see how everything was moving. I noticed that no matter what time I came around I would find the former water boy hard at work. I never learned when he slept.

"Now, there seemed to be nothing remarkable about this fellow except his industry. The only way in which he attracted attention was by working longer hours and getting better results than any one else.

"It was not long before we needed an assistant superintendent. The ex-water boy got the job. When we established our great armour plate department there was not the slightest difference of opinion among the partners as to who should be manager. It was the youth with the liking for *overtime service.*

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"Today that ex-water boy, Alva C. Dinkey, is head of a great steel company and very wealthy. His rise was predicted on his willingness to work as long as there was any work to be done.

"If a young man entering industry were to ask me for advice, I would say: 'Don't be afraid of imperiling your health by giving a few extra hours to the company that pays your salary.' "

From this quotation just made as well as from Captain Bill's Story (see later chapter: "Influence of De 'Boss' on his men") and finally from my personal observations in many cases, I came to the conclusion that most of the employers when they have to fill important vacant positions are willing to give the preference to a man who, as Schwab says, "is not afraid to work overtime."

Overtime is, therefore, regarded as a *barometer* of *conscientiousness* and in most cases is considered as *a sure guarantee of success.*

From the first glance this seems to be very logical but if you want to go to the bottom of everything, you will find that it is not always so.

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I am *now* very cautious. I have been deceived many times, because I did *not* always know how to distinguish between the real truth and things that have only the *appearance* of being the truth.

It happened to me, I confess, just the same as it happened to a score of other men, who are not able to distinguish between real gems, diamonds or gold, from imitations which look like the real thing, and I do not want to be continually deceived.

Of course, I never will congratulate anyone who stops work as soon as the whistle blows. If he be a draftsman, for instance, he will stop in the middle of the tracing of a line or, perhaps *if he be a carpenter driving a nail he will not finish the blow but leave his hammer suspended in the air if gravity did not object.**

The men who stay in the factory after the whistle blows are either **bluffers** or really **hard workers.**

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*NOTE.—For suggesting the last instance given the author is indebted to the editor, and to whom he, in turn, is indebted is his own secret.

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In both cases, and especially in the last case, I am not an admirer of an overtime system. I have for backing my statement the following reasons:

To my mind ***overtime working*** *is just as* ***harmful*** *to the* ***brains*** *as* ***over eating*** *is* ***injurious*** *to the* ***stomach.***

Going further in my comparison, I shall say, overworking, as well as overeating, when done once in a while cannot be very much detrimental to the spirit as well as to the body, but this is certainly not the case when **misused.**

After all, *we do not judge the value of a lawyer by the number of hours he needs to make his speeches. It is only the value of his arguments that counts.*

Why wouldn't it be the same with men of the industrial world?

If a man worked conscientiously, say, eight hours a day, that is wholly enough and that is self-evident. In fact, if he be conscientious, this means that he likes his job, and hence we can be sure his brains are almost continuously absorbed

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with everything relating to his work. If this man stay *every day* in the factory after hours his capability becomes dull, and his work is accordingly inefficient.

To my mind, a man who works hard must have some *refreshing recreation* which will permit him to forget for a while his business. In so acting he will be able to come the next day into the factory with a better disposition, with a fresh and healthy spirit and *ready* as well as *capable* of doing real good work.

Some refreshing recreation is still more to be considered as absolutely beneficial in case of an employee who is animated with the sacred fire of enthusiasm about his job. For, he will think about it, not only while he is in the factory, but *even* when he is out of it.

He might do whatever he desires to expel from his memory any thought concerning his daily occupation, he would *not* be able to succeed. *His thoughts will follow him everywhere, and always just as his shadow does.* Theatres, banquets or any other kind of entertainments would

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help him very little to forget what he wants to forget.

If one will follow his looks, he will notice now and then a sudden change in the expression of his eyes which is a sure indication of absent-mindedness. This happened just in a moment when he seems to be at the paroxysm of enjoying some intense pleasure. The "coming out of it" is marked by a convulsion of his entire body.

Again, to depict things just as they are, I must add that even sleep will not always prevent him dreaming about all kinds of his favorite problems. Finally, though it happens frequently, he will find the long searching solution for some complicated problem just when he awoke in the morning or at any time during the night.

Of course, as I said before, this will only happen when a man is enthusiastic about his job.

And when not? *In this case, it is the direct business of the management to find out means*

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to make the man enthusiastic. This is a question of knowing how to handle men.

I find it necessary to cite the following instances:

Second Instance

Dealing With Overtime

I knew a high official of a company in charge of installing a new factory for the fulfillment of large ammunition orders.

Be it said in passing it was a complete failure.

He asked me at once my office hours. Habitually, I replied, "From nine to five."

"Why don't you stay longer, as I do?"

He retorted with a forced smile, expressing the feeling of *self-satisfaction*, with a bit of irony.

"You can find me," he continued, "at my office as early in the morning and as late in the evening as you want."

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"I do not do as you do," I said, "because, if there be *no* serious reason for working overtime, I find it preferable to go home and take my rest, or even to grant myself some distraction."

If I had told him that the main thing, after all, is assuredly not to spend long hours in a factory but to give good results, I would have told the truth but hurt his feelings.

In fact, I had the opportunity to observe the doings and sayings of this man during several months, every day and all day long. What I saw, convinced me that he did not take any pleasure in his work and this is why he has not been able to sit down for one hour and do *real good work*, but he ran from one department to another seemingly to "chase" for something.

He was totally unable to grasp quickly any new idea even if it differed only *in the slightest manner* with the scant knowledge that he gathered in his bolt and nut department where he has spent the best twenty years of his life. Of course he had

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always an easy excuse that he did this kind of work for the first time in his life.

He knew almost everything going on in the factory. But he knew it only superficially.

While, I must admit, this man was born with a natural intelligence, he did *not* try to use the full strength of his faculties, but tried to dazzle his employers by doing the theatrical, the spectacular.

Schwab says, "A man of that kind who attempts to do this is bound to fail."

Not always!

This is *sometimes* true, but it is true also, that before the company decided to remove him from his "management," he caused the company a direct loss of millions and the loss of considerable time, the amount of which, although it is not very easy to determine, was undoubtedly extremely high.

This man was not fired: First because there have been other "geniuses" and "overtime hard workers" similar to him who have been no less guilty

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than he was and secondly, as he knew everything and everybody he managed to dazzle again his employer and to obtain another good position.

Third Instance

Dealing with Overtime as well as with a System Intended to make an Employee Enthusiastic about his Work

This story has been told to me by the chief engineer of an important factory. I find the story very interesting as well as instructive.

The company took Mr. "X" on a month's trial. During this time he was given a corner in the so-called engineering department. The company put at his disposal, two draftsmen and a stenographer.

This office was occupied by about twenty-five engineers, draftsmen and various clerks. Some of them had been busy with the designing of tools, buildings, shaftings, counter-shaftings, etc., some others with production problems for the shop, and still others with estimates, etc.

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All these men had been under the supervision of a very young engineer, perhaps no older than twenty-two years.

Mr. "X" was told that all employees of this office had been compelled by the over-zealous assistant manager to work overtime at least three times a week. He was told again that the assistant manager did not want to pay for overtime, justifying his action by saying, that in war time all employees had to do their bit for their country.

This was a private concern located in Canada.

The funny part of it was that in the morning the employees were *allowed to come as they pleased;* some of them—half an hour, some others one hour, and even half a day late. No one will be surprised if I tell him that the employees of course, found it very natural to be paid, not only for justified, but even for unjustified absences, and on the other hand they had a totally different idea about overtime. They wanted even to be remunerated at *double* price rate for overtime.

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The dissatisfaction was general.

As Mr. "X" knew (since it was agreed upon by the management when Mr. "X" was engaged) that sooner or later he would become the head of this department, he found it necessary to begin to study the state of mind of his future subordinates. He was also inquisitive to know how they performed their duties.

This is what he observed: The discipline was totally lacking. The men did not pay the slightest attention to their chief. All day long they worked very little. They were telling all kinds of stories to each other. They took care, for instance, to inform each and everybody in a *loud* voice, what they did or what they intended to do that evening or on Sunday. Or again, one man sitting in one corner shouted out to the man sitting in the opposite corner, his impression of the different baseball leagues or the dry or wet laws. The eating of apples, oranges, etc., as well as the throwing of all kinds of rubbish at the head of those who had been busy was a current matter.

One can readily understand that in this case

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even if it happened that somebody had the desire to work, he was unable to on account of the unbearable noise that the rest of the employees made.

Needless to say, also, that if nothing were done during working hours (although there was a possibility of one of the bosses coming there to "inspect," the work done) less than nothing was done during the *overtime*, as everybody knew that all the bosses had gone home.

As soon as Mr. "X" was appointed chief of the engineering department he totally changed the existing policy. In fact, he informed all his subordinates that in future there would be no overtime work.

If (*in extreme cases of emergency*) it was necessary for one or more to work overtime he would be paid accordingly. But, as a rule, overtime was totally suppressed.

Again he informed his subordinates, that, in the future, they must come at the right time in the morning. They had to stay eight hours in the

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office, but on the contrary, in the afternoon they were *not* to stay one minute overtime.

Not only they had the *right* to go home as soon as the whistle blew, but none of the "bosses" would find fault with them if they did so.

"Somebody" informed the "boss" about the *new* policy of Mr. "X." Similar "somebodys" are numerous in any factory. This is the only thing that they are able to do . . . and they do it whenever a favorable occasion presents itself. If the occasion be slow in coming, they are capable of inventing one.

One day the "boss" came into Mr. "X's" office just about five minutes before the whistle blew (a thing he seldom did before) and remained there under a futile pretext.

All the employees were afraid to stop when the whistle blew. They began to look at each other with amazement and curiosity. Everybody waited to see what the other would do.

While the head was talking with Mr. "X," the latter excused himself and said to the men,

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"Gentlemen, you can go home, but please be on time in the morning."

The next day, and in general, whenever the opportunity presented itself, he didn't miss it. Mr. "X" had a friendly talk with his men. He told them that the main thing is not simply to be present at their desks eight hours per day, but *what is really necessary is to do a real good and honest job during the time for which they are paid.*

It is very important that they work conscientiously whether their chief be present in the office or not. Their sentiment of duty and not the fear of being discharged or scolded must compel them to do so.

To work less than the time for which they are paid is equal to stealing the company's money.

On the contrary, as a rule, it is not necessary to work more than the given time. It is self-evident that if it be in case of emergency, or, if it be a matter of experiments, which is to be considered as a means of development of their own education and ability, it is another question.

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Mr. "X" decided to do everything possible in order to find out the proper means to make the men interested, and *even enthusiastic* about their job.

The first thing he did was to have a talk with everyone of his subordinates. He told them repeatedly the following: "It is to your interest to learn thoroughly the trade you selected and to work whole heartedly. This will be of great help to you in securing success. *Even* in case when you have somebody to 'push you.' It would certainly not hurt you to have good knowledge as one of your assets, but it will be all the more useful to you in case you have to struggle alone for your existence."

He questioned everyone carefully; what *kind* of *study* and *work* he had performed in his life, and what kind of work he would like to do.

While some of them informed him that they would prefer to make drawings, others on the contrary, said that they hated to be bending over a desk all day and they would prefer to make, for instance, time study.

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Still others told him that they would be very glad if they could be given the supervision of installing machines, erecting foundations, building or other jobs similar to this.

As Mr. "X" had to solve all kinds of problems (layouts, time study, foundations, shaftings, improvement of machines, working methods, etc.), he did not see why it would not be easy for him to satisfy everybody by giving each one problems to solve or other tasks according to his special training, temperament and desires.

If it happened that one of the young men informed Mr. "X" that he would like very much to perform a given job, but was afraid to undertake it because he never did it before, Mr. "X" gave the young man encouragement in telling him: "That's all right, all I ask of you is to have the *good will* and the *mere will-power* to obtain good results, and in this case I will do everything possible to help you."

Mr. "X" tried to explain to the young man, as clearly as possible, and as often as necessary, *how* to perform his duties.

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Mr. "X" advised the young man where he could find the necessary information: at the libraries or somewhere else; sometimes even he accompanied the young man to the library.

Twice a day, at least, Mr. "X" went from one man to another asking them *how* their work was progressing. This allowed Mr. "X" to become acquainted with the qualities as well as the faults of all the young men under his supervision.

They had been informed that they had the right to give their own opinions plainly without using diplomacy, even if they be sure that their ideas are totally different from the ideas of the boss.

They must forget the bad habit that young men generally have to say to their chief, "Yes Sir, I will do just as you say." They say so, *even in case when they* believe that the chief is mistaken.

Concerning Mr. "X" himself, he considered it as his sacred duty to think over every statement made by the men, and sincerely try to find out if

their expressed ideas be right or wrong. If right, Mr. "X" was not ashamed to say, jokingly, "I am sorry, you are right."

What was the result? Every young man had become interested in what he was doing. He worked with enthusiasm because he became sincerely hopeful that he would be able to go ahead under the new chief. Everybody felt that a spirit of justice was in the atmosphere. It was sufficient for the chief to go out from his office and to come back *unexpectedly* and he would be sure to find everyone bending over his desk busy with his job.

Sometimes some of the men were humming) which proves inside satisfaction), but they were undoubtedly totally absorbed with what they were doing. It was not possible to see every ten minutes a man pulling out his watch. Just the same it was frequently possible to hear, when the whistle blew, one or another of the men exclaim: "It is already noon. Time goes very quickly to-day."

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To maintain this good state of mind in his office,

Mr. "X" did not lose time. He had a talk with the president of the company. He asked him to be permitted to raise the salaries whenever necessary of every one of his men who worked under his supervision and who deserved it.

He justified his demands in saying:

Whereas the raising of the salaries will amount to no more than two hundred dollars a month, ten or fifteen dollars representing the raising of salary of one man consist for a small employee, a very large amount. In fact, this pays his rent, or it lessens considerably his other burdens.

On the other hand, the company has no interest in making small economy such as the raising of the small salaries. What the company wants, is, to make big profits and to cut down large expenses. This would only be possible if all employees grant their sincere co-operation and they will most likely do it when they are satisfied.

Of course, I do not consider the raising of salaries as the only way, or best means of encouraging men. A practical system of bonuses, when just, is by far the most preferable.

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RESISTANCE TO NEW IDEAS

Human Element Has a Good or Bad Influence On the Results Obtained in Industries

Resistance of Employees to the Introduction Of New Systems of Management in Factories to be Reorganized

Is the Sense of Duty or the Fear of Being Punished Sufficient to Overcome this Resistance?

How to Reward Employees

Let us consider the case of a factory in operation for some years, hence having already an organization which it is necessary to reorganize.

Two cases must be considered:

1. The manufacturers hesitate to make any changes simply because they are afraid of trouble with their workmen (strikes, etc.).

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2. Some manufacturers have already adopted methods advanced by various specialists who are considered as great authorities and they have not succeeded.

Concerning the First Case: Fear of Hostility

To say that these fears are groundless would be an exaggeration.

We must expect a serious resistance, *not only* from the mechanics, but very often in a still greater degree, from the other *employees.*

I think it is necessary to analyze this question further and find out the essential causes of this hostility.

I am sure I do not exaggerate when I say that all engineers who are entrusted with the problem of introducing logical working methods in factories, have to fight very hard when they are honest, conscientious, and want to obtain results.

This happens everywhere:

No matter *where* the factory is located, either in

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America, or Europe, again it is absolutely immaterial *what kind* of industry is referred to, it is always the same thing.

It is a very hard struggle for an organizer to get propositions carried out according to his ideas.

Only in one case is it relatively easy. This is when a "boss" or the general manager himself, (who has full liberty to do what he wants), is eager to introduce a rational system in the factory.

In this case *only* can he obtain good and quick results. (It is self-evident if it happen that he be a man of extreme energy and ability on the question of organization matters.)

In all other cases it is *not* very easy to make things run smoothly.

Why? This is a question of the ***human element.***

1. The same thing is happening all the time.

   Nobody likes to be disturbed in his habits, *especially when they are bad ones.* This is all the more true that:

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2. The employees, *even* if they lose nothing from the introduction of a new system, can see no benefit *either* to be derived from same.

   The strongest "reason" for opposition is the following:

   There could be some chances that their "dear friends" (co-workers) will benefit by the adoption of a new system of organization. How, in this case, for goodness sake, could anyone expect them to be, if not happy, at least—indifferent? Do *not*, *please*, ask too much of them!

3. Some employers say: "But we pay his salary, hence he ***must*** do his ***duty.***"

   Yes, this is perfectly true, but, men cannot be expected to do their duty simply because it is their duty!

Men will do their duty only under certain conditions, namely:

1. Because they are *afraid* of being *punished.*
2. Because they have *hopes* of being *rewarded* for their attention to duties.

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Concerning punishment, almost everybody (at least once in his life) has heard a factory employee say: "I must do what the 'Boss' says because he pays my salary and he has the right to kick me out if I do not do what he requires."

To do one's *duty* is all very well and good as far as it goes, but does it go far?

Nothing can overcome positive resistance. The story of a railroad strike in Austria before the war proves this theory substantially.

The employees went on strike the so called "La greve perlée," that is *they did everything according to laws and regulations, i.e.,* their strict *duties* and yet the results were nevertheless disastrous for the railroads.

But, again, it is not an easy job since you can't have constantly a detective, a policeman, a judge, etc., behind every employee to watch him and to make him do his duty. As soon as you turn your back, the employee will do just the opposite to what you want him to do.

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In reality not even reasonably good results can be obtained from things done with a bad will.

Conclusion: *The fear of resistance has, therefore, a real justification.*

But is this reason enough for giving up the very great benefit that might result from a re-organization?

Decidedly No.

Moreover, in what field is anyone free from opposition?

You must constantly bear in mind that:

If matters be left as they are, the business goes badly, and still more trouble will be encountered.

It may be indeed a very different kind of trouble, but it is none the less trouble and often even of a worse kind.

It is, therefore, better to make the changes which after all will give final success, than to let matters drift and become so bad that it will be too late to help.

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The case is like that of a doctor who says to his patient: "If you decide to undergo the operation that I advise (in spite of its painful nature, which makes your hesitation quite comprehensible), I can guarantee that your health will be greatly benefited. If, on the other hand, you put off the operation, your illness will become more and more serious, and your chances of recovery grow less."

What must be done to overcome any resistance to the introduction of a new system?

It is the business of the head of an industry to "*convince*" each of his employees (who can help or offer a serious resistance) that the proposed system is directly or indirectly useful to him. The method of convincing is, of course, not the same in each case. Threats, raising of wages or salaries, premiums, compliments, etc., are remedies to be used and *it must be applied to everyone of them according to his* ***mentality, education, temperament,*** *etc.*

The most effective method of "convincing" is a profit-sharing system in proportion to the services rendered. *The profit being not only promised but really paid.*

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DISCIPLINE OF EMPLOYEES

Customs to be Observed in the Matter of Discipline

Punishment of Employees, Workmen and Clerks

After I have considered all the questions having to do with supervision, it is logical to take up the matter of discipline.

This is a matter of great importance.

The inflicting of punishment cannot be entrusted to everyone, as it may lead to injustice to the men and occasion constant labor troubles—strikes not excluded.

Many investigators have considered this question and have studied it in detail.

Some of them have tried the experiment of being

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very kind and polite to all the workmen *without* making an exception whatsoever among the different individuals; and that of being very rude and arbitrary with *all* of them.

They have noted the results of these systems on each individual and these results tabulated by special card systems.

After a time they tried to derive from them the best methods for future use.

"Remedies" Adopted by Some Organizers

One well-known organizer after a number of results obtained by detailed observations, decided to punish all the workmen without exception by means of fines.

To show that this was done in a disinterested manner, these fines were given to the general welfare fund for the men.

Another organizer, not less known, decided to suspend the men for one or more days, according to the gravity of the offences, etc.

In my opinion *it is impossible to adopt a* ***single type*** *of punishment for all the workmen.*

There are among them various types of men who differ one from another by education, mentality, health, etc., therefore, it is necessary that those who deal with the question should consider the individuals separately so as to determine in each case, what kind of remedy is the most rational.

From some workmen you can obtain good results simply by appealing to their conscience, to their pride, desire for an increase of wages or a premium, while with others nothing, except severity (criticism, fines, suspension, threats of discharge, etc.) will do.

The kind of *reward* or *punishment* is equally not a matter of indifference either.

As a matter of fact, there are many workmen who are only too glad to be laid off for a few days from time to time, either because they have other work to do at home, or because they have a chance for

a vacation (this is particularly true of young people, girls as well as boys, who live with their parents), or those who want to go on a spree. It is, therefore, no punishment to suspend them for a time.

Similarly young apprentices who have to give all the money gained to their parents care little or nothing for a fine; they simply say that they have earned somewhat less, but a threat of discharge or a letter to their parents may produce the desired effect.

Another type of workman would rather leave the factory than accept the infliction of a fine, however small, but since these are usually good workmen, the business undergoes a double loss, because others must be engaged to replace them and their training requires a long time.

In any case, *whatever kind of punishment be used, it must be absolutely justified.*

When there is *the least doubt*, no punishment *should be given*, for if a single man be punished who is innocent, there is the risk of stirring up a

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hatred that will undo all the good that has been previously accomplished.

On the other hand, if the *punishment be really merited* and if not too severe, the desired result is obtained *without causing any ill feeling.*

We must not forget that when a subordinate is punished this does not remain a secret; everyone knows and talks about it, and should the punishment be unjust, they all sympathize with the victim, even if he go to the extent of destroying the company's property. Better than this, they often are only too *glad* to see him do this, and may even actively aid him.

Summary

1. *Punish as little as possible. If it cannot be avoided, at least be sure that the punishment is absolutely justified.*
2. *When there is the least doubt, abstain from reprimands and still more from punishments.*
3. *The severest punishment, if it be just, is less dangerous than a reprimand that is not merited.*

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The following comparison may be of value as an illustration. The driver of a private carriage never holds the whip in his hands. He keeps it by his side where he has it ready whenever needed, and he knows that it is there whenever the occasion for its use may arise.

If the horse could tell his feelings he would no doubt say that he is proud of the good treatment he receives, since he is not constantly threatened with the whip.

But he might not say even if he could, that he knows perfectly well the whip is there, in case he go "too far. . . . "

About the Necessity of a Thorough Investigation of Presented Excuses

Let me cite an example of what may happen frequently. We know that a certain workman should turn out a given number of pieces daily. On looking over the records, we find that he is not doing his full work.

If we ask him "why" he will give bad reasons for want of good ones.

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It will usually be useless and even aangerous to grow angry and punish him, but it is equally dangerous to take at its face value, everything he says.

It is best, each time such a case presents itself, to go to the bottom of it, to verify in the presence of the workman, often in the shops among all the others, all the reasons he gives, so as to show him that one is not willing to be imposed on.

If this investigation before the men at work have the disadvantage of momentarily distracting their attention, on the other hand it will show them the folly of trying to lie out of their trouble.

Similar investigations need not often be made.

Let us take a concrete example of excuses given:

The workman to justify his defective output claims that it is due to the fault of the store room clerks, that they delayed in bringing him some materials or tools.

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If we have the impression that his statement is false, or at least much exaggerated, we should send at once for those whom he blamed and try in the presence of the other workmen to find out whether he be right.

We will often find that the materials were, as a matter of fact, delivered *a little later* than they should have been, but that the delay was by no means enough to explain so great a decrease of output.

This should be clearly explained to the workman in question, and furthermore, he should be informed that the matter will be overlooked this time and in future all materials, tools, etc., are to be furnished him in time and *even before* he needs them, so that he shall have no excuse for a recurrence of the incident.

To sum up each time a deficiency be noticed, the matter should be thoroughly investigated, verifying all the explanation given, and not leaving the question until it is completely cleared up.

PURCHASING DEPARTMENT

Sales Agents—By whom, when, and how shall they be received?

Relations between

1. **Purchasing and**
2. **Sales Agents**
3. **Graft and its effect.**

A construction plant must ordinarily buy:

1. Machines, tools, oil, belts, coal, and all other supplies necessary for its own needs;
2. Raw materials, iron, steel, brass, nickel, wood, etc., necessary for its products.
3. Office supplies, printing, advertising, etc.

Even after so brief an enumeration, it is easy to see that

1. At least fifty per cent of the current funds of the business must pass through the purchasing department.

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2. The person in charge of this department should be a *technician* (since it is the technical section of the business that is better than any other department qualified to indicate exactly the quantity and nature of the supplies needed).
3. He should make out the orders for this purpose and establish the prices.

We can also see that any technician cannot attend to the work. It requires a good technician who is also a good business man—unless the business part of the work be confided to a very capable agent of the commercial section.

In any case, whoever has charge of the department, must be known for his *scrupulous honesty.*

An Unscrupulous Purchasing Agent

A badly organized purchasing department may be a great danger to the business. An unscrupulous purchasing agent will not buy from honest firms who furnish proper goods at reasonable prices, but from those who give him commissions.

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But since the firm that must divide its profits this way will *not* take care to furnish the *right goods*, nor to furnish them at the *right time*, the harm resulting from this is incalculable.

The sales agents may be blamed for trying to place their goods by means of bribes, but the fact remains that if they try to remain honest, it is often disastrous for them. They will be turned out without pity, and some plausible pretext will not always be difficult to be found for this action. Often their goods are sent back without being unpacked, under the false pretext that they *are defective.*

What are the results?

The same thing that happens with a cook who grafts on the shops she buys from; instead of feeding her employers on first class food, she will give them dishes made up from inferior and adulterated articles. Their digestion will suffer from this and other ailments are sure to follow.

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Who is to be blamed?

Many manufacturers refuse to talk to sales agents themselves, leaving this to any subordinate, or not having it done at all. Their excuse is that their time is *too valuable* to waste in seeing everyone that comes into the office.

In my opinion they are wrong in considering the salesman as an intruder. Since *these salesmen can help them very much indeed.*

In fact, the manufacturers have not the time to find out all the novelties, inventions and improvements that are being produced in all the fields with which they have to deal.

On the other hand, most of the salesmen are specialists familiar with their business. They therefore know the merits and defects of the machines used in their lines. If, therefore, they are willing to sacrifice their time and money in travelling and "grilling" in waiting rooms of different factories trying to sell a *new* machine, it is because they are convinced that it has real advantages over those already in the market. Thus they hope to make a success of it.

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There is always a certain guarantee that a *newly* invented and constructed machine or device, etc., has its incontestable advantages over the old (similar) machines existing in the market. Why? Because there are 90% chances that otherwise

1. The Patent Office would not have granted the patent.
2. The banker would not have advanced the money required and
3. The manufacturer himself would not have undertaken the construction etc., if they all would not have been convinced that they back up a good idea, finance a truly lucrative business and construct an item which, under favorable conditions, is able to supersede the old ones.

The manufacturer, therefore, has every advantage in seeing them personally, and learning what he can from them.

Some manufacturers may say:

"A salesman cares very little whether the machine

he sells really has any advantages, what he wants is to sell his goods at the best possible price without caring about the quality."

The answer is:

The salesmen know very well how difficult it is to *gain* the confidence of new customers and how *easy* it is to lose the ones they already have. Thus the serious salesmen will take special care not to recommend goods of questionable quality.

Besides it is the buyer's business to determine himself whether or not the article be of good quality and, in general, possesses the advantages claimed for it.

As for the loss of time of which the manufacturers complain in receiving salesmen, it may be remarked that the salesman himself makes every morning a selection of firms that he has to visit.

For instance, one whose customers are bakers will not go calling on butchers, knowing that in doing so, he is wasting his time. It is therefore reasonable to assume that any salesman who comes to see, say, a shoe manufacturer has something that may be of value to him.

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I believe also by spending only *five minutes* with each salesman we can have plenty of time to get all the necessary information as to the *use* of the article, the *prices*, *qualities*, *times* of *delivery*, *references*, etc.

In half a day, therefore, a great number of salesmen can be interviewed. In view of the importance of the question, my advice is, no doubt worthy of serious consideration.

As for giving the salesman a blank form to fill out, as is sometimes done, it must be rejected as altogether useless.

Since no manufacturer consumes what he produces, he may try this out for himself temporarily (for the sake of a practical training) by becoming salesman for his own goods. He will soon find that it is impossible to point out the quality of his merchandise in order to make it attractive to the buyer by writing a few words on a slip of paper.

To present a catalogue is better, but better still, is to send it, since this is more economical.

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Does this system give good results? This is another question . . . since everyone knows that catalogues are seldom looked at. . . . !

Let me add, moreover, what is known to everyone, that many purchasing agents find time to talk for hours to those salesmen who give them commissions and who amuse them by talking of matters that have nothing to do with business, while sales agents, who have really valuable products for sale, are badly received, or not at all. In any case, they have no chance to sell their goods.

Even the companies that buy at auction cannot claim to have eliminated these abuses; on the contrary, they may be even greater.

It is *therefore necessary that the owner of the business or the general manager in person receive salesmen and to investigate and learn what they have to say.*

Raw Materials and Supplies

How, When and *Where* to Buy.

It is true that a vast loss occurs every year because raw materials are *not* ready on time; are *not* of

the right *quantity* and *quality* and are *not* purchased at the *lowest possible prices.*

I advise making out a list of all necessary materials and supplies with the quantities likely to be used annually. We then should find out all the firms (local or foreign) who can furnish them under the best conditions in regard to quality, cost and delivery.

If possible, we should get prices from all these firms each time we need new materials.

I do not say that this is always easy, or even possible.

For instance, if in the case of manufacturing electric lamps, glass cannot be bought from a different source each time because different kinds of glass combine badly.

But as a rule it is quite possible to get prices in this way. Let me cite a typical case:

I asked two firms for the price of certain small brass fittings. One quoted a price of three dollars a thousand, the other one dollar a thousand, and the reason was simply because the former was at the moment overloaded with work. He was therefore willing to let the order escape while the other who had little work, was glad to make at least enough to cover his overhead expenses.

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RATIONAL ORGANIZATION OF A BUSINESS

Supervision; Minimum Amount of Information Necessary for the Employer to be Provided with Every Day

Superintendence

I have already said that it is absolutely necessary that a rational organization should be able to indicate in every case a method of superintendence which allows the chief to follow easily, day by day, the exact course of the losses, their causes, and the effect on them of the measures taken against them.

It is essential that everything that is done in the factory, however unimportant; and everybody concerned in the business, whatever his functions may be, should be subject to a permanent system of superintendence.

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In my opinion if the men know that they are constantly under observation, and that all their acts, whether good or bad, are quickly known and appreciated at their true value, they will be more careful, work better, and remain honest. Thus, we will profit greatly by the reduction of misdeeds and punishments. Hence, the method of superintendence would be such that when the chief comes to the works he may quickly ascertain the exact conditions in any department.

The most important question to be considered is, therefore, that of the superintendence of everything going on in the factory. In order that this superintendence may be really valuable, it is necessary:

1. That the system itself, and those in charge of it should also be submitted to a proper control.
2. That you may be able, day by day, to judge exactly:
    a. The quality and quantity of raw materials, partly and finished pieces, made and stored in the stock room.
    b. The quality and number of tools in use and in reserve.

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c. The quality and number of shipped goods.
d. The daily expenses of all sorts.
e. The progress of orders, etc., and finally
f. The behavior of the employees.

All this can be summarized as follows:

You should always *suspect and respect* everybody (yourself not excluded), thus you have to watch and check up constantly everybody and everything and here, too, yourself not excluded.

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VALUE OF SUPERINTENDENCE OF EMPLOYEES (ESPECIALLY WORKMEN) WHEN WORK STARTS OR STOPS

What this means in Dollars and Cents if they *do not start* to Work when the Whistle Blows and when they *stop* to produce a long time *before* the signal is given to do so

This is a *Daily* occurrence; but this arrives particularly at the eve and immediately after holidays

Inspection—Discipline

How great are the losses to the business due to the fact that workmen do not *start* to work when the whistle blows!

Let anyone judge for himself.

Let him watch the men without their knowledge,

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and he will find, even in the best organized factories that each time they start to work, at least one hour is consumed before the factory is properly working.

Whether the men be paid by time, piece work, or any other system, it makes no difference.

They always lack the ***will power*** and ***good will*** necessary to conquer inertia before starting work.

This happens both in the morning and afternoon, every day in the week, and on Mondays and the days following holidays it is even more marked.

Consider the loss from this cause alone to a factory employing a large number of workmen.

I strongly advise appointing someone in each factory whose authority is sufficient to see that each time the work starts, everyone is at his place on time.

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From time to time, without notifying anybody, the manager should be present on the arrival of the workmen (either in the morning or afternoon).

He will appear unexpectedly a little time before work begins; he will sometimes visit one shop, sometimes another.

He will place himself so that he can see everything at a glance (as explained above).

He will see some of the men (over zealous people) start work at once, *even before the signal*, others on the contrary will delay starting even after the hour. So, naturally, he will say:

"If they do this when I am here, how long must it take them to start when there is nobody to watch them?"

Of course, this state of affairs must be ended, but it must be done most prudently—you can never be too prudent. Be careful, the air is full of electricity, the least spark may cause an explosion. Let the management make the least mistake by

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doing something capable of a wrong interpretation, or injuring somebody's pride, and you may be sure that there will always be plenty of fault finders to take it up. When the explosion has occurred and produced its disastrous effects, you are sure that they (the fault finders) will have taken care not to be among its victims.

Nine times out of ten, you will find yourself dealing with an excellent workman or with a trouble maker. The good workman, knowing his value and considering himself indispensable, says to you: "I don't like being watched all the time; I can do my work without that sort of thing."

As for the others, they are glad to scrap with the "boss." They like to play at being martyrs before the other men—thus they can find occasion to organize trouble.

Of course, I do not advise encouraging the over-zealous and punishing the laggards. I prefer to speak to them in a language they understand better.

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It is quite an art to be able to speak so as to be understood by one's subordinates. We must speak *differently* to an electrician, for instance, than to a laborer.

Let us therefore say to the workman who begins *before* the hour (the over zealous):

"We do not ask you to work more than the regular time; *we want no presents from you. Work conscientiously during the regular hours, that is all we ask, and if we be sure that you are serious and do good work, even when we are not there to watch you, we will recognize it, as you will see, either by a bonus or an increase of wages.*"

As for the second case (the good workman who does not care to start to work in the right time and doesn't like to be watched either), we must in some way show that we have particularly noticed him.

If we find, several times in succession, that the same workman persists in not starting on the hour, we will go and say to him:

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"You must understand, being an intelligent

man, that this is unfair to the company and to your superiors. We are not here to watch you, in particular, but everybody. We know you are a good worker and if all the men were like you, we would be glad of the opportunity to come here less often and to attend to other matters sitting comfortably in our office chair, but what can we do?

"It is not our fault if some of the men have *no sense of duty*, thus they do not work unless watched or else some other men, instead of liking their work and doing it as good as possible, prefer to do the least they can. Hence we are obliged to watch everything that goes on. Besides, since we are responsible for the work, it is not only our *right* but even our *duty* to watch all the men under our authority.

And after all what would you say if the company at the end of the week were to "dock" you not much, suppose a half dollar?

"Would you be satisfied?"

"Of course, not," says the workman.

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"Well, then, how can you expect the company to let you work only nine and a half hours instead of ten that you are paid for?

"Since you are known to be a good workman, the others will take you as a model and follow your example, thus the loss will be still greater.

"Is that fair?

"*You ask others to be just to you, you should be equally willing to be just to others.*

"We will be glad to give ourselves to you as an example.

"Whenever you feel that we (or anyone else) had been unjust to you, come and speak to us about it and we promise to examine the matter with strict impartiality.

"If, afterwards, you still feel that we are unfair, you may do as you please. But we do not believe this will be the case."

Whether the conversation with the manager has flattered or persuaded him, or whether he be

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PRESENT LIST OF EMPLOYEES (PER EVERY 15 DAYS)

MARCH		FROM 8-12 MARCH						FROM 12-18 MARCH 1919										FROM 19-22					
		8		9		10		12		13		14		15		16		17		19		20		21	
NO.	NAME	THUR.		FRI.		SAT.		MON.		THUR.		WED.		THUR.		FRI.		SAT.		MON.		THUR		WED.	
		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
316	Allen	5	5	4	-	5	3	5	5	5	5	5	5	5	5	5	3	3	5	5	5	5	5	5	5
317	Smith	3	5	5	5	5	5	0	0	1	4	5	6	5	5	3	1	3	3	5	5	5	5	5	6
318	Baum	5	5	0	5	0	0	2	5	5	5	5	5	5	5	5	5	5	5	5	0	0	0	5	5

SALARIES PER 15 DAYS

MARCH		FROM 8 to 22 JANUARY												TOTAL		UNIT PRICE PER		SUM		TOTAL SUM		PREMIUM	FINE	TO PAY	ADVANCE	TO PAY
NO.	NAME	THUR. 8	FRI. 9	SAT. 10	MON. 12	THUR. 13	WED. 14	THUR. 15	FRI. 16	SAT. 17	MON. 19	THUR. 20	WED. 21	HOUR	PIECES	HR.	%	HR.	% PIECES	$	¢					
512	Jeffers	10	10	10	10	10	5	10	10	10	5	5	10	105												
513	Baum	560	310												870											
514	Hatter																									
515	Lewis																									

FIG. 21.—Time card giving present list of employees, their salaries, and working time of each.

afraid of being punished if he continue to resist, or perhaps for both these reasons at once, the result is always satisfactory, and the workman realizes that there is nothing for him to do but make up his mind to start work on time.

Since he has not appeared ready to give a threat, he has not become the manager's enemy. This much is certain and is all that is necessary.

As for the others in the shop (those of weaker character or less ability), they will easily give in, once the best workmen no longer set a bad example, and incite them to resistance.

As for the trouble maker the remedy is to be found in the preceding chapter.

Under no pretext should the men be allowed to come and go as they please; it is a *bad habit that gains them nothing, and that seriously injures the factory.*

The chief will do well to consult the general time sheets as often as possible, unless special cards, as shown in fig. 21, be used in connection with automatic time clocks.

By means of these cards the chief will soon find that some few men are habitually late or absent, and very often these are the ones who live nearest the factory. It is therefore easy for them to be more prompt, if they be only willing.

From time to time, without previous notice, the chief should be present when the shops open, both morning and afternoon. He should come unannounced a few minutes before work begins. He should go sometimes to one shop, sometimes to another, and post himself where he can see at a glance everything that goes on.

He will certainly find that a great many of the men are slow in getting to work, and he will take accordingly such measures that will encourage them to be more prompt.

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INFLUENCE OF THE BOSS ON HIS MEN

Employees Are Such as Their "Bosses" Make Them

Statement: A good "boss" can improve even a mediocre employee while a "bum boss" will discourage and even kill forever the most capable and the best devoted employee.

To uphold my theory I will cite three instances. The first instance I took from Charles Schwab's book, "Succeeding With What You Have." The second instance I picked up among hundreds of other similar instances, which I encountered myself in my career, or with which my friends have been kind enough to supply me.

First Instance

How the Selection of Employees is Done in Some Factories

Schwab tells us in his book, "Succeeding With

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What You Have," *how* "old Captain Bill Jones (who in the opinion of Charles Schwab was perhaps the greatest leader of men the steel business has ever known, and who had charge of the Braddock plant for Carnegie) picked high grade assistants with marvelous surety."

We will read the story:

Captain Bill needs a "specially capable young man to handle *an important piece of engineering at Scotia.*" Do you believe, reader, that he at once had decided to take a man who already has held a similar position and consequently has more or less the required experience in this kind of problems? *But not at all!* Although a man of that kind could easily be found, either in his own organization, or outside of same, he asked his superintendent to recommend a *draftsman* who is able to take the position of the "specially capable engineer, etc."

The superintendent, who ***ought to know*** *the capability of each and every one of his subordinates,* confessed that he was unable to make any distinction, but being afraid to have been

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too frank, he added afterwards; "*Why, captain, any one of them will fill the bill.*" Now, when Captain Bill said, very logically indeed, "But there must be one more capable man than another, who is he?" The superintendent answered, while shaking his head and very likely scratching behind his ear with his hand, "They are all bright, hustling youngsters."

Stories of similar kind reader you will find all over the world and in the majority of factories.

Now we can admire how Captain Bill proceeded to find the capable man for the given position.

Captain Bill said to the superintendent: "Tell every man to stick on the job until seven o'clock. I will pick out Scotia's chief for you."

As seven o'clock drew near Captain Bill noticed that the men kept looking up to see how much more time they had to put in. All, save one, over in the corner a young man absorbed so that he seemed to have forgotten there was a clock in the room. When the hour finally came, the

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others hustled for their coats and hats. This chap was still bending over his desk.

He was the man whom Capt. Bill sent up to Scotia!

As you can see reader, Captain Bill was of the opinion that ***any*** *draftsman*, provided he ***works overtime*** (I will be generous and I admit that he really ***works*** and does not "make believe that he does something." Bluff and hypocrisy are not very rare birds in the cage called factory) would be capable of becoming a first class engineer and executive.

I am very sorry that Captain Bill did not find *better means* of selection. If I had known Captain Bill, I, perhaps, would have advised him to go *first* and see *what* the young man was doing, and *how* he was doing it.

Perhaps if he had investigated the matter he would have found the young man belonged to the class of "We will make them believe that we are doing something."

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I will give afterwards a genuine instance which will prove that I have a good reason to be very cautious.

At any rate, man can be very conscientious and interested in whatever he is doing, but this doesn't mean that he *possesses* the necessary "stuff" to become a first class engineer and executive.

The book further adds: "One hardly *needs* to add that later this young man became a most valued engineer, and a high salaried man."

As this really happened, what does it prove? Would this prove that Captain Bill's system of picking up a "specially capable engineer" is to be considered as the *best* and is to be recommended for the *general use* of other manufacturers? I hardly think so.

To my judgment, this proves that this has been a *pure* and *lucky hazard* for both: for the captain as well as for the *young man* to come together. In fact, the captain could have made a choice of an *unworthy* man as easy as he has made the choice of a *good* one, since the

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manner of making the choice is a *blind* one—it is mere guess work.

As a matter of fact, can somebody claim that it is *very seldom* the case that companies have hired unworthy men and trusted them with big positions?

The trouble is that it is frequently only after *months* have elapsed that the companies were faced with the consequences of their mistakes.

Is the manner of picking up employees of these companies worse than that of Captain Bill's?

I do not think so.

This is why I claim that it was only a lucky *hazard* that the young man who has been picked up by Captain Bill was like Eugene Grace, "seething with the stuff of which big men are built." Concerning the young man? He also was uncommonly lucky to come in the road of Captain Bill for the following reasons:

1. As I understand, from Charles Schwab's story, Captain Bill knew his business (steel

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business) far better than anyone else who worked *with* or *under* him.

2. Besides this, Captain Bill was considered as being honest, just, good hearted and a hard worker.

Men of that character inspire confidence in themselves, are esteemed and even liked by their employees. Men like Captain Bill are *capable* (if so disposed) of *improving* the human material put at their disposal, instead of *spoiling* it by *discouraging* the *most capable* and the best devoted subordinates. Bosses of the latter type are frequently found.

I am almost sure that Captain Bill practices the same *splendid system* inaugurated by Carnegie and followed by Charles Schwab, *i.e.*, to *train* up "his boys." *Here lies the whole secret!*

Captain Bill trained "his boy" and he didn't care if he so sacrificed huge sums of money for paying the apprenticeship of a young man in order to make him a first class engineer.

Nobody can make me believe that the young

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draftsman, even when working under the most ideal conditions, was able to become a first class engineer and executive without making lots of mistakes which the company was obliged to pay for, and not only this, but probably Captain Bill paid the "boy"—"his boy"—not only a fixed salary but he made him interested in the *admirable profit-sharing system* warmly *advocated* and I *hope* ***practiced*** also, by Charles Schwab, *whereby each "man* not only blue overalls dressed workmen, but even 'workmen' wearing snow white collars and carefully pressed pants (office employees) *would share directly in the profit for* ***which he himself is responsible.***" (*Page 8 in Charles Schwab's book*).

Is there any wonder that the "boy" came through?

One idea bothered me all the time: I can have no rest, and do you know what the idea is?

I think, perhaps, the superintendent's statements were right. If you remember, he said, "Why, Captain Bill, they are all bright, hustling youngsters, *any one* of them will fill the bill."

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It seems to me that in many cases when a man is born with *natural intelligence* he can do valuable work and succeed *if* he be lucky enough to find strong and rich men who are disposed to help him in order that he may render valuable service.

Even when he is discouraged or lacks confidence in himself, he can be made to possess the *will power* and *good will* to make good.

In our case I would say that: "if Captain Bill had trained ***any one*** of the *other* 'boys' in the *same manner* and *spirit* as he did with his selected 'boy,' *he would have obtained similar results.*"

Of course the superintendent said it, but he didn't mean it, whereas I mean it, and say it. . . .

Second Instance

How Some "Bosses" Do Not Make Use of the Rule Given at the Beginning of the Chapter *i. e.* to Improve Instead of Spoiling Their Employees

In a very important factory the following incident occurred. The company having received large

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orders (worth hundreds of millions) had decided to build new shops.

Four men were appointed for the purpose of making the layout of the projected new shops. All the four men were located in a large drawing room for themselves.

One was an engineer with considerable shop experience, while two of the others were first class draftsmen for construction of devices and civil engineering matters. Finally, the fourth man was a young tracer with very little, if any, experience. The tracer was the youngest.

The *engineer*, as well as the two *draftsmen*, had been told that they were under the supervision of the *young tracer*.

One can admire this famous system. The management did *not* indeed care to put the "right man in the right place," just the same as they did *not* take in account the *human element*. Otherwise they would certainly not have put under the supervision of a young tracer,—engineers, draftsmen and besides this—all aged men.

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Why was this "*intelligent*" arrangement made?

The reason was that they "*knew*" the tracer better than the others, because the tracer had been employed at the factory for a few years, while the other three were newcomers.

A splendid reason!

Only first class brains are able to conceive such "strong" and "sound" ideas. . . .

All the four men were kept in the drawing room for many weeks and nobody bothered to see *what* they were doing and *how* they did it?

Most of the time all of them were idle.

The "chief" (the young tracer) often went to seek information, but he usually returned saying, "while some of the bosses claimed to ignore everything about the job, some others, on the contrary, seemed not to want to bother with it."

However, the naked truth was that the four men did not know what to do and the result was that all the work that had been done by the four men

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during *several* weeks, did not amount to anything, and could certainly have been done in one week of even *only reasonable* work.

To "*kill time*," everyone of the four men did as he pleased. They wrote letters, read newspapers, sang, boxed, etc.

The "chief" said repeatedly to his "subordinates," "You chaps do everything you like, under one condition only, you must try not to be caught by the bosses. . . . Your policy must be: 'We will make them believe that we are doing something'."

Once, one of the high officials of the company, accompanied by his assistant, had the "fancy" to come and see what the four men had done.

He opened only the door and did *not even step inside* in order to investigate exactly *what* and *how* they were doing their duties.

In this case no wonder he was not able to know *what the newly engaged men were capable of doing.*

It happened that the moment the "big boss"

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opened the door, three of the men did not follow the "*sage advice*" given by the "chief" to the "bunch," since he himself did not follow his own advice.

Three of the men had been busy in friendly conversation while the remaining of the group (one of the draftsmen) had been bent upon his drawing table and his attention seemed to be *extremely absorbed* with his job.

The face of the high official at once became reddened and he exclaimed (while pointing his finger toward the man bent upon his drawing table), "Only this man is working while the others are lazy. I really don't know," he added, "how they are not ashamed to take the company's money for doing nothing."

If the "big boss" had taken the trouble to investigate the whole affair, he would have known that the men were far from being guilty. As no one of the "bosses" cared to keep them busy, they simply did not know what to do.

The funny part of it was this: After the high

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official has been through with his "investigation," the three men, inquisitive as they were, went to their "honest" comrade in order to see what kind of drawing he was making. When they saw this they forgot the insulting and undeserved scolding of the "big boss" and laughed heartily.

The sketch was hardly a decent picture to exhibit.

Can somebody claim when reading this genuine story that the Company knew how to handle men, or else, can anybody have the courage to blame four employees for *not* having "made good" when working under such conditions?

Third Instance

How Some "Bosses" Discourage Their Best Employees

When a new auxiliary branch building of a very large concern had been completed and the organization and erecting of the shops and offices began, one of the highest officials came to pay a visit.

Be it said in passing that, hitherto, the same official very seldom paid a visit to this branch,

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although millions had already been spent there and the success of an order worth several hundred million dollars depended upon it.

He went from one department to another, accompanied by several officials.

While he was near one of the numerous offices he opened the door, glanced around him and said to the head of the office, "you have far too many men in your office, you can very well do without some of them."

The head of the office, knowing that it was useless and even dangerous to contradict the "official," answered with the *classic* phrase, "I will do just as you say, sir."

The next day, according to the order of the "higher up" some of the employees had been taken out from there and either discharged or sent back to the main factory.

The high official did not take the trouble (he did not have time, he would probably claim) to investigate the whole matter. He did not ask

the chief of the office to give him his reasons why he had *seemingly* more men in his office than he needed.

If he had done this, he would have found that there was rather a shortage than an excess of employees.

In fact, as everybody knows, when a new factory is in the stage of being organized, there are lots of problems as well as troubles of all kinds to be taken care of.

It is true that most of these problems deal with difficulties that disappear after everything has been settled, but *before* this is done, there are such a large number of problems to solve and difficulties to overcome, that we must possess an immense reservoir of energy, perseverance, and patience in order to be able to disentangle matters and obtain some results.

It is no wonder, therefore, that scores of men are necessary during the period of erecting a factory, and yet to my mind it is better to have a few men too many than not enough as the time of organization (which means the time of unlimited trouble) has to be *curtailed* as much as possible.

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The result was that everything has been disorganized after the withdrawal of the employees.

The head of the office, who already has been tired of fighting all kinds of difficulties that he met constantly on his way, became discouraged and decided that "life is too short, etc.," and it doesn't pay "to be more of a Catholic than the Holy Father himself. . . ."

Concerning the "big boss," I would not be surprised to hear that he grasped the first opportunity to inform the board of directors that only his "keen eye" was capable of detecting waste in the new organization.

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WORKMAN'S HOSTILE ATTITUDE CHANGED TO A FRIENDLY ONE

How Workmen Have Been Induced to Change Their Attitude From Hostile, as it Was (Which Manifested Itself by "Sabotage" of the Company's Goods) to a Very Friendly One (Which Gave the Highest Efficiency)

A concern located "somewhere in Europe," and manufacturing an article of general use, succeeded about twenty years ago in monopolizing the markets the world over, but as the management did not fear competition they obtained the prices asked for and thus made huge profits.

Did the company succeed because of the better *quality* of its products? Was this on account of the low prices, or both? Nothing of the kind; there was two reasons for this:

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1. The company was protected against competition by patents, and
2. The monopoly of Russian markets alone was amply sufficient to justify the success of the company. Why? Because, as everybody knows, with the "old" regime in Russia, it was possible to present for cash any fictitious bill (where both prices and number of pieces delivered was several times higher than the true figures) provided the sales agent knew *how* and *where* to "grease" an official's palm.

Is there any wonder that the company made a fortune in a very short time? The unheard of success of the company stimulated the inventive spirit of a score of specialists in various countries. While some of them found a totally different system, but "*just as good*" as the other, some others improved considerably the article sold by the company.

Bankers granted the necessary financial support. New modern factories provided with the best machine tools and devices were installed all over the continent.

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Perfected systems of management were introduced, and thus it was possible to obtain the best results from point of view, of *quality* and *cost*, and especially since the buyers were accustomed to high prices the competitive companies did not need to sell at excessively low prices.

As it happens always in such cases, the competition becomes very hard for the concern we are considering. Our company lost, little by little, its good reputation and customers. In order to retain them it was necessary to lower the prices (in most cases even beneath the prices of competition).

Things went bad. The company lost every year more and more money. It was necessary, therefore, to find means which would save the situation. But how?

Instead of modernizing the equipment and introducing new working methods, one of the "*strong*" men of the company had the following "clever idea" which he succeeded in obtaining the approval of the board of directors:

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First of all, he informed all employees that:

1. Thereafter and as long as the crisis lasted, their salary would be reduced five per cent, which would be repaid them with additional five per cent as soon as the conditions improved.

2. The workmen's wages, if they would not be reduced, they would not be increased either during the crisis (the duration of which is unforeseen).

What was the result? I would not surprise anybody by saying:

1. The best of the office force, as well as the *most skilled* workmen, left the company and only the old men, inexperienced boys and finally "good for nothings" remained.

2. Even those who remained became enemies of the company because of its policy and showed their mood in the most expressive and expensive manner.
   Not only carelessness, but even *theft* occurred every day.

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To illustrate the state of mind of the employees, I will cite only one instance.

An important order for a foreign government was completed and ready to be shipped. The order was composed of groups of expensive apparatus, fixed on tables made of no less expensive wood. While the order was waiting for the crating operation, one of the workmen approached the tables and smashed it with a hammer. All the workmen who saw the deliberate destructiveness laughed heartily. The foreman who equally saw the "theft" turned his head and went away with a significant smile.

In general, the atmosphere was charged with electricity. It was no secret that the workmen boiled over any time the general manager "dared" to go through the shops.

As soon as he opened the door of any department, at once his presence was mysteriously announced to everybody "working" there or in their adjacent shops.

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It was absolutely forbidden (by whom?) to any

workman to give him any information he might ask for.

Each one in the factory (beginning with the directors), if he made a mistake, he tried to shift the responsibility on someone else. The "someone," as it was to be expected, protested vehemently, and cared to take the "gallery" in confidence. Thus when a dispute occurred in the meeting of the board of directors (and this happened each and every time they had a meeting), even the laborers knew all about it.

Many employees took advantage of it. When, for instance, an employee neglected purposely or not, to obey an order given to him by one of the executives, he went to the latter's "dear friend," another executive, and secured from him protection against the first executive.

Bribery in the purchasing department, the stealing of expensive materials from the store room, as well as entering in the pay roll a list of imaginary names of workmen and pocketing the money was a current matter.

The company was near bankruptcy. The board of directors decided to engage a new manager.

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The latter succeeded in convincing the board of directors that the "savings" represented by a reduction of five per cent of the office force's salary amounted to very little.

Again, to refuse to increase wages even to those workmen who deserve it, is not a commendable policy.

The new manager was given free hand to cope with the situation, as best he could.

The first inspection he made in going through the shops showed him that almost all of the work was spoiled. Wastes of every kind were to be seen in every corner.

The main causes of this excessive waste were:

1. Incompetence;
2. Lack of practice in precise work;
3. Lack of proper raw materials, and
4. Sabotage.

It was necessary, therefore, to find at any price a way to reduce gradually the waste to the normal figures. Otherwise, no better results was to be expected.

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The new manager began by studying in detail and classifying all the factors having a bad influence on the result so as to be able to eliminate them one by one.

After a certain time he succeeded so far as the machines, the purchasing department, etc., were concerned, and the only thing left to bother with was the resistance of the workmen.

How could he work against incompetence and deliberate destructiveness?

He first decided to verify for himself, at least once a day, the work of each workman *not* as to the *quantity*, but *solely* as to *quality*. In making the rounds, he was always accompanied by the foreman and superintendents of the various shops.

Although what he saw often would have justified not only blame but even punishment, he took care not to resort to these measures; and this was fortunately for him as well as for the company's interest, for if he had acted as he should have, he would have made everybody his enemy; not only the workmen, but even the management. This

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is because the workmen would have lost no opportunity to complain of him to the *owners*.

Evidently, they would *not* explain and *justify* their hostility to its true causes, but we can be sure that the workmen would not have any trouble to find fault with the new manager which he will consider to be unpardonable—the color of his hair, for instance . . . or something equally important.

Thus the new manager might come to be disliked by the management as well.

After some reflection the new manager decided to give a bonus for good workmanship. But as the *manner* of giving is more important than the thing given itself, he proceeded in the following manner: Each time in verifying the work, he found it was well done, he took pains to compliment the workman and made out for him on the *spot*, *before all the others*, *a slip* of this sort.

Certificate good for.....
Granted.....date.....to workman
No.....for.....*Superior Workmanship. Scraps No.....*
Signed.....

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In giving this certificate to the workman (always in everybody's presence), he was careful to add:

"You can cash this bonus in eight days from now." He did it for two reasons namely:

1. The workman was obliged to carry the certificate around with him for several days, and, as it was to be expected, he would show it to everybody as a sign of his superiority "justly" recognized by the new chief and, far from criticizing his manager, he advertized his good qualities. The workman's interest counselled him to do this; for, praising the manager he added also to his own reputation by making the opinion of the new manager about him more valuable. . .

2. The new manager knew that while he is busy with the workman all other workmen would watch him, and when he leaves the building they will "rush" to inquire *what* "he" wanted, said, etc., etc.

This method succeeded even better than the new manager had dared to hope. All the men

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became interested in their work and tried to see who could excel the others. *They would even stop the new manager as he went through the shops and ask him not to forget on his next rounds to come to inspect their job.*

To those who may be interested in knowing how much was spent on these certificates? It did not come to over fifty dollars a month. Since there were about five hundred workmen in the shops this is scarcely an excessive amount.

Once the daily rounds of the manager came to be not merely "*tolerated*," but even, as said before, actually looked forward to. He "dared" now and then, as he went through the shops, to criticize *both* the *quality* and the *quantity* of the work. Thus he obtained excellent results with no difficulty whatever.

After all it is *not new* that the *manner* of going about a task is often of the *greatest importance.*

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RESULTS OBTAINED BY MEANS OF EFFICIENCY SYSTEMS

Do Efficiency Systems Always Give Good Results in Industries? And If Not, Why Not?

Some manufacturers say: "But we are progressive. Our minds are always open to good ideas. We are only too glad to learn from someone who will convince us that he knows matters better than we do."

The sincerity of this statement is fully proven by the fact that we really have made efforts to introduce a new system of management. Only in spite of everything, our best efforts have not been met with success.

As it is by no means rare to hear similar complaints on the part of manufacturers it is

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interesting, because useful, to consider the questions more in detail, in order to be able to judge correctly the causes and to find out the corresponding remedies.

1. We must know something about the value of the methods adapted, and,
2. How the methods considered have been applied.

To simplify matters, we will admit that the methods adapted were the *best ones*, for otherwise the man who made the unlucky choice is to be held responsible, and, in this case, we will find that results have not been obtained for one of the following reasons:

1. Either because the *user* had not sufficiently studied and assimilated them, or
2. He knew the subject perfectly well, but he did not know how to make others understand, believe and willing to accept the new ideas.
3. The employees resisted the adoption of new systems.

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4. Whatever be the case the new system has been *badly applied* and finally,
5. I will go further than this and say: "Suppose now that the points raised in systems 1, 2, 3 and 4 worked in the best possible manner and that the organizer possessed the best *good will* to obtain results—all this is very far from being sufficient.

   What is necessary is that he possess an immense reservoir of *enthusiasm*, *will power* and *perseverance*, in order to overcome all inertia and difficulties of any kind encountered. Concerning case 1 and 2 here also, the user is to blame.

In regard to 3, it is easy to understand that in order to obtain the proper results from a new system it is not merely enough to have good machine tools, first class raw materials and that the workmen alone should give their maximum output. All other employees, foremen, stock clerks, superintendents, draughtsmen, engineers, managers, etc., must also be interested in the profits obtained through the introduction of improvements, *i.e.*, they must receive direct pecuniary benefit from it.

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This, however, is seldom the case. *All the employees who are paid a regular salary are always overlooked in the arrangement.*

Since they have nothing to gain and perhaps everything to lose with the introduction of new systems, it is, therefore, no wonder that the employees do not show a particular enthusiasm for new ideas, and do everything possible to retard or even to nullify the results obtained.

To illustrate, I shall consider only one example: When, *for the first time*, the consulting engineer asks, for instance, the foreman, to help him to make some small changes he will do it "gladly." He will do it all the more "gladly" when he is good humored and he does not see, at once, where it will hurt his interest, feelings or even where it can inconvenience him, or . . . be useful to his "dear friend" another foreman.

When the consulting engineer asks the same foreman for the *second time* to help him to introduce *another* change, the foreman would not receive him "*as gladly*" as he did the first time.

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The *more* frequently the consulting engineer comes to the foreman with similar demands, the *less* friendly the latter will be, and finally the attitude of the foreman will become hostile.

Of course, the foreman will always find an easy excuse for his manner of acting.

But we do not need even go as far as this.

In fact, we will take the easiest case, as for instance the following: The employees would not be "in a hurry" to secure the proper delivery to the workman of raw materials and other supplies, tools, etc., so that the workman, *no matter how willing he is to increase his output, loses a great part of his time in waiting for the necessary tools and materials.*

What is the remedy?

In order to obviate this state of affairs, *the company must promise all its employees a share in the profits and, evidently, it must keep its promises.*

Although I do not think it is necessary to prove

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this assertion because it is a common truth, I can nevertheless add the following.

As we all know:

1. The teachers of all religions found that it is necessary to paint before the eyes of their followers a picture of heaven in order to get them to do what they teach as being right and wrong.
2. Again, as everybody knows, a horse will obey you better and quicker if you show him a piece of sugar as a reward.

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PROFIT SHARING SYSTEM FOR EMPLOYEES

(Existing and Proposed)

Extreme Inefficiency of Existing Profit Sharing Systems

Many *first class* factories, banks and similar organizations have adopted a profit-sharing system which consists in granting as a bonus to their employees a certain percentage of their salary.

The bonuses are taken from the benefit made by the company during the same year. In exchange for this bonus the company expects the employees to make their best efforts in obtaining good results, and of course (as a matter which is self-evident) to work overtime (long hours and often) without any compensation whatsoever.

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I do not believe in this system. The same is *unjust.* It is unjust to both: to the company and to the employees.

The reasons?

Because the bonus is given to *every* employee *indiscriminately.* Thus two employees will receive the same bonus even though one be more intelligent, more devoted to the interest of the company or more ambitious, etc., than the other. Better than this—*even* the "good for nothings" do receive bonuses just as well as do the *real* honest and intelligent worker.

Since any organization is honeycombed with "*artists*" knowing *how* to appear to the "boss" as being "the most efficient" employees while in reality they do the most harm to the company, the system is rather *demoralizing.*

Those who doubt the exactness of my statement will change their mind after a very brief cross-examination of employees of these organizations and after watching their manner of working and when listening to their private and intimate conversations.

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Why has the bonus system been adopted?

Almost all those to whom I explained my objections to this profit-sharing system retorted about the following: "But since the system was adopted and maintained by the *most important organizations* we *must* admit the value of same (otherwise they would soon have been discarded). My answer to this is: The fact that large organizations have adopted a given system doesn't mean anything. For, if you study the "history" of a system you will see that the same was adopted in 90% of large organizations simply because they wanted to *imitate* the *first* 10% who adopted the system. The proof of it lies in this:

Try to advocate a *new system*, everybody will put *the same* question "*Who is using it?*"

Very seldom will you find somebody who will not be afraid to be the first one to try it out.

Moreover—tell him that scores of *small* concerns (or organizations) are using it successfully and there are 99 odds against one that it would not convince him of the value of your system. But as soon as you prove to him that a *very*

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prominent firm has carried out your idea, you have good chances that he also may adopt it.

As we can see, it is very far from being a case of the *value* of the idea itself but one of *human element* (or rather human foolishness).

But *how*—for heavens sake, did the supposed 10% of the large organizations *adopt* and *maintain* this profit-sharing system if it was not worth while to do so?

Here is how I can back up my statement: It is very simple to understand what usually happens. Someone of the "big bosses" realized the necessity of giving "something" to his subordinates.

It is absolutely immaterial to know why he wanted to do so. Is it a sentiment of philanthropy, a feeling of justice or a mere intelligent policy which is responsible for the adaptation of the profit-sharing system? The "big boss" informed his "boys" of his intention to distribute among them annually a part of the company's profits.

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Would any one expect to see the subordinate to *complain* of the *imperfection* of the new system?

They think (and justly indeed), that it is better to have an imperfect system than nothing at all. . .

Now arises another question:

"Why has *this* profit-sharing system been adopted and not one similar to the bonus system for the use of the workmen? Because the "bosses" are ignorant of what an *employee* is capable of doing. In other words, they know (in certain occasions at least) that a given machine is able to turn out so many pieces per hour. Similarly, it could be easily estimated how many units a workman can perform in a given time unit, thus the employers have a starting point. But most of the time nobody is able to tell what a bookkeeper, cashier, draftsman, foreman, storekeeper, etc., etc., *can do* if he want to be (or he is) ambitious. Better than this no one is capable of telling you (basing his statements on real records) *what* these above mentioned men *did* yesterday or today or *will do* tomorrow.

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THE AUTHOR'S PROFIT SHARING SYSTEM

How and When Shall the Company Pay the Profits to the Employees?

One of the best means that I propose (in order to avoid the various forms of resistance which an organizer encounters in a factory) is to give the employees a share in the profits resulting from the introduction of any improvements into the factory.

For instance, the company will divide all profits resulting from improvements in the following proportion: *One-third it will retain for itself, give one-third to the re-organizer and one-third to the employees.*

I am sure that if the company consented to adopt this system, all resistance on the part of the employees would cease at once as if by magic.

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When Are the Profits to be Paid?

The best results will be obtained in case the company make arrangements to enable all employees (who are entitled) to get their profits each and every time they receive their fixed salary. This is based on a psychological point. When a foreman, for instance, whose fixed monthly salary is $150 receives an additional sum of say $25 as a bonus, his part in the profit resulting from the improvement on a given item (or existing condition) in some corner of the factory, this extra amount will be a very "strong argument" in favor of the new system.

The more "arguments" of this kind the foreman receives, the more "convinced" he will be that the system is efficient. Moreover, there are 100 odds to one that he will even find that the consulting engineer is the best and most efficient man in the world. . . .

Not only will he (the foreman) do this, but he will exercise his own brains to find out where improvements are possible.

Thus it will be the foreman "in person" who will

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"run" after the consulting engineer and reproach him for his inability to see all the spots where improvements are possible. . . .

It is certainly not necessary to have a profound knowledge of human nature in order to find out that this will be the case.

Now, then, if everything be true that was said when we considered the case of the foreman, the same thing is equally true when considering the case of the general superintendent, chief engineer, etc., way down and even "higher up."

When it is a question of hiring a new employee, in this case, the company should at once promise him a *fixed salary plus a bonus based on his* ***ability*** *to increase the efficiency* ***in his line.***

I must insist that if promises of profit sharing are to accomplish the desired result, namely to *encourage the employees to give their maximum efforts*, there must be a *formal agreement* and not only this but the *form* of the agreements adopted must be *simple*, *precise*, *clear*, and must give immediate results (say every week or, at least, every month, for instance).

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If this be overlooked and if the form of the document be long and vague, and contains "diplomatic" phrases such as "net profit," "gross profit," "after the levying of certain sums," etc., and if finally the benefit be put off to some indefinite period, then we can be sure that the employees will have no confidence in it, and will work no harder than before.

The desired result will therefore not be obtained, and this is *doubly* regrettable:

1. Because of the *loss of time* and *money*, and
2. Because if the company be *sincere*, it will be *obliged*, when the designated time arrives, to distribute *premiums* that have *not* been earned.

I will conclude by saying that in the best case, when the company follows my advice to pay a bonus every week or every month to the employees, it will give the maximum result only when the consulting engineer or any other responsible official (or officials) of the company use a good deal of common sense, patience and perseverance.

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It may be necessary for the consulting engineer to come back at the men very often and explain *over and over again* the "why" and "wherefore" in order to convince them that the new advocated system is right.

In general, it is a matter of *supervision* on the part of the chiefs to see that the subordinates rightly understand and follow the instructions given them *regularly* and *punctually*.

It will be necessary to keep the "*pressure*" on till the new system has been rooted deep enough and then it may be time to gradually relax. Once the habit is acquired, we will inevitably see that the people that were most bitter at the beginning against the innovation became afterwards just those that are the most enthusiastic.

I find it interesting to cite the following instance, which will corroborate my ideas.

A European lawyer friend of mine, told me that his father was a manager in a coal mine. He was paid a fixed monthly salary plus, as a bonus, a given number of francs for each ton of coal extracted from the mine.

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Whenever his father came home with his pay envelope, his mother opened the same and putting aside, to begin with, the *salary*, as if it do not interest her, began to count the *bonus*.

She wanted to know how many tons it represented, how many *more* tons (*or less*) the mine has produced. In the latter case, she wanted to know the *reason*, and what his father could or should do in order to improve in the future the *bonus part of the pay envelope*. . . .

Thus the company had in his mother the most "devoted" (at any rate) the most useful employee.

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FALSE IDEAS OF EVERYTHING

First Instance

False Ideas about Economic Generalities

Some factory officials (from the foreman, store clerk, and those higher up) misuse too often the word "economy." If you propose to him to buy a new machine or device or to make some changes, be it the least expensive, he refuses energetically under the "cheap" pretext, "I am first of all for economy." He does this even when he has the money at his disposal.

Sometimes it is done in good faith, and it is solely to be attributed to *mere ignorance on the question*, but sometimes also, it is to be explained by the desire to "throw pepper in the eyes of the big bosses."

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They repeat all the more freely the standard

phrase, "I am first of all for economy," when they expected that it would be repeated in "high places."

The following explanation is destined for the *first named;* this means, for those who are in good faith, and ought to see things as they should be seen.

As a rule, it shall be remembered, that it is never a question of *how much money you spend, but what you can get for it.*

It is better to spend $100,000, if you are sure to get even a reasonable profit on account of this expense than to keep the money in your safe (suppose that you have the same at your disposal) and lose every day directly and indirectly.

In other words, I would not spend one dollar if it were useless but I would not hesitate for a moment to spend huge sums provided I am convinced that I can make some reasonable profit out of it.

To illustrate:

Suppose that a newspaper has 100,000 circulation, and that the owner of the paper, instead of

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using the best machinery, persists in getting it out by old-fashioned methods, at most being contented to buy some small and inexpensive devices, etc.

In order to execute the purely mechanical work there will then be a large force of typesetters, messengers, folders, etc., to say nothing of the extra superintendence and bookkeeping, rent of offices, factory space, etc.

Suppose also that the "boss" wishes to obtain the greatest possible output from his workers by the suppression of unnecessary motions, and other "efficiency systems."

He calls into his office one of the girls employed as a folder, for instance, and he says to her something of this sort: "See here, Maggie, you get $1.25 a day for folding 50 papers a minute. I'll pay you $1.40 a day if you will fold 75 papers a minute."

"That suits you, Maggie? Very well, then. Here is what you have to do.

"When you work, you will make such and such a motion with your left hand and look to the right

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instead of the left, and when you talk to the other girls during working hours you will try to talk about ten thousand words an hour less than you do now.

The proprietor of the paper, after having introduced moving picture machines, stop watches, card systems and special time keepers, after having overcome the resistance of Maggie and her neighbors, as well as that of the union, will not, after all, have increased the output so very much.

We will suppose now that the "boss," instead of running up against these super-efficient systems like a moth against an arc light, had had the simple idea of buying a machine that cuts, pastes, and folds the paper at the rate of 50,000 copies an hour.

The work would be considerably quicker, cleaner and better done, and he would have saved himself money and trouble.

Moreover, the price of the new machine will be gained in a very short time.

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Second Instance

It is Often Not Sufficient to Have Good Ideas The Most Important Thing is to Know How to Make Others Admit that Your Ideas Are Good

What Usually Happened in Factories?

When in school and there is a *theoretical* problem to be solved, the first and most important thing to do is, to find out the most "*elegant*" solution of the problem.

From the very moment this is done we can state that the task is accomplished.

However, in practice, it is by no means sufficient to be able to solve problems, it is necessary to *be able to demonstrate the value of an idea, improvements, etc., and to make indorse the same by your superiors* ***and*** *subordinates.*

As for the superiors?

There are usually not only *one* but *several* superiors to contend with. Usually, also, these "dear friends" are terribly jealous of each other and, furthermore, they have seldom (if at all) received

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the same training and possess the same mentality, temperament, etc. This being the case, if you want your ideas to be indorsed by them favorably, you must manœuvre very cleverly.

The *manner* of exposing your case, the system of *pleading, justifying* the decisions *adapted, or rejected* relative to your ideas, improvement, etc., should vary each time according to the personality of every one of the superiors.

To act otherwise is to make a sure failure.

As we can see from what has just been said: It is not sufficient to find even an ingenious and practical idea or improvement, etc.; it is far more complicated than this.

When finally all the approvals of the superiors have been obtained, this is not sufficient. The most difficult part is still to come. In fact, the system must yet be adopted by *equals and subordinates.*

Those who think that this is much easier (because since it is a question of subordinates who have

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only to execute the orders given them) are, in my opinion, greatly mistaken; is even now harder than before, to obtain satisfactory results.

For, when we have to deal with superiors they seldom hesitate to speak their mind openly, whether their opinion be favorable or not. We therefore know at least where we stand, but subordinates, on the other hand, dare *not* resist *openly*, and therefore do so secretly.

If we cannot overcome this hidden resistance, we are sure to meet defeat.

Even under the best conditions, that is, when nearly all the subordinates recognize the value of the attempt to introduce a system and their *good will* is assured, success is not altogether certain. We must *constantly* use all our means to overcome the ***inertia*** of our co-workers.

We have to watch them *constantly* and investigate them at least *daily* in order to ascertain:

1. If they understood the "why" and "wherefore" of their duties, for despite their

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willingness (that we assume for granted) to make good the least lack of understanding may spoil everything.

2. If they possess at least the minimum amount of *perseverance* required. Good will alone is certainly not enough.

If some of them lack perseverance *i. e.* if they be impulsive, they will work well by fits and starts, and if *at times they neglect their work, the whole mechanism will be deranged*, and there may be none with enough energy, perseverance, and willingness to watch constantly and find all these cases of backsliding and all the little faults that have crept into the work, and thus overcome them all and keep everyone on the right path.

We must, therefore, be constantly vigilant, persevering and energetic during *a long period*, until everybody is quite used to the system and *would find it hard to drop it.*

False Ideas About the *Nature* and *Value* of Help Given to a Company by an Expert in Management *Coming From Outside*

When a consulting engineer (despisingly called "efficiency engineer") offers his services to a large

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manufacturing corporation, he usually gets a *standard* answer, "We don't need outside help." "We have our own men. They receive large salaries (this is not always how the men themselves feel about it) and *they ought* to know their business."

Their business? This means, their *specialty* and the *local conditions?* Yes, they undoubtedly know it (I hope so at least for the welfare of the company).

But, do they know *thoroughly*, and above all, *have they at their disposal the required time* to devote themselves exclusively to purely *organization* problems?

I should unhesitatingly answer, "No, they don't."

An illustration will depict better my meaning: Suppose a company want to build a new machine shop, or it want to re-locate its machine tools in a shop already existing.

Would someone be able to convince me that the best layout can be made by (or under the supervision of) the superintendent?

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He would not be able to do it, *even* should he be checked up and *guided* by his bosses from one side and should he be *helped* from his foreman, draftsmen, etc., on the other side.

Even granted that all those persons possess perfectly well the required knowledge and training for making a perfect layout, they have no time to sit down and devote *exclusively* their time during an entire *day* and even *weeks* and work out all necessary data for the purpose in question.

In fact, if one will observe the superintendent or any other person (works-manager, chief engineer, etc.) in order to know how he spends his time daily, he will notice that every one of them is bothered I should say every minute with hundreds of questions put up to them by many people.

The telephone rings unceasingly, the messenger boys bring in numberless drawings, sketches, letters, memorandums, etc., or many men come and go in this office.

Everybody wants to know something.

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How in this case, may I ask, could any one of them concentrate his mind (as he *ought* to) for the purpose of finding out the best results?

Factory Executives are Hardly Trained as Organizers

This is all the more difficult that in reality not one of them has a clear vision of all the different matters which are *directly* and *indirectly* connected with the problems of making perfect layouts. Since *most of the persons engaged in an industry are not prepared for this work of efficiency organization by the necessary studies.*

As a matter of fact, manufacturers are usually:

1. Either bankers or promoters. This means without the least *technical* school training, or,
2. *Engineers*, technicians who did not secure in schools the knowledge of *how* to solve correctly problems dealing with *efficiency* (not administration) problems.

If my statement relative to the bankers is self-evident, it does not need further explanation.

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On the other hand, the same could not be said about engineers. Thus I deem advisable to add the following:

Among engineers, some of them, the more fortunate ones, as soon as their studies are finished, pass at once, for one reason or another, into important positions; presidents of companies, board of directors, general secretaries, etc.

While the others, the less fortunate ones, they also, for various reasons, become merely salary employees, occupying minor positions, similar to draftsmen, etc. The highest position is that of a head of a department.

The former group (president, director, etc.) are too much occupied with other matters to concern themselves with actual factory conditions.

As for the others, they might really do useful work in the internal organization efficiency work, but, to put the matter clearly, they never had the opportunity to get a proper training.

How and *where* those people could be very useful is:

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1. In answering completely and as promptly as possible to all questions put up to them by the trained specialist and relative to *local conditions*. Things, which they *ought* to know perfectly well, and
2. To *judge* the value of the layout done by the professional with the help of information furnished to him by them.

I will finish by saying that: If it be true that the officials of the company know better the local conditions than the trained specialists coming from outside is able to know them, it is also true that the latter knows much better than the officials *how to make use* of this information concerning *local conditions*.

To compare a factory offical to a trained specialist is just the same as to compare an *amateur singer* or *painter* to a *professional singer* or *painter*.

Of course, there are amateurs and amateurs just the same as there are professionals and professionals.

Better than this. I agree that a talented amateur is worth more than a mediocre professional—

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but in the ***majority of cases,*** when we want to have a real good painting, or music, we prefer the work of a professional.

Resume

From what I have just said it is *evident* that

1. Factory officials are unable to solve in a satisfactory manner problems dealing with purely organization matters.
2. Only from highly trained engineers (preferably coming from outside, thus they are *not* affected by inside "atmospheric conditions") can we expect to have good results.

Let us now see, in the light of practical instance, how a manufacturer looks upon this question.

As I said before: the manufacturer does not have a very clear idea about what kind of knowledge is necessary to possess when undertaking the reorganization of a factory.

He thinks that you must have worked *for years* either in his own shops or in others of the *same*

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kind before being able to undertake the reorganization of *his* plant.

1st Practical Instance

Concerning false ideas about the *nature* and *value* of outside help given by a consulting engineer.

Consider, for example, a brick-making establishment. Offer, for instance, your services for the organization of the factory.

The first question the proprietor will ask you is:

"Have you ever worked at this trade?"

If you answer in the negative, he will say, sarcastically:

"What! you have never worked at the trade and you think you know more about it than we do, and yet we have been in it for generations?"

At first sight this argument seems logical and undisputable, but if we analyze it, it is seen to be absolutely false. It resembles the truth, just

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as a paste diamond resembles a real one. It would be true if it were a question of engaging a superintendent or foreman or an assembler of machines, but it ceases to be true when it is a question of organizing or reorganizing any kind of a factory; for, *to know how to make bricks or to keep the books is one thing, and to find a series of rules and methods of obtaining a greater output from the machines and employees is quite another.*

A foreman brick-maker, no matter how skilled in his specialty, could be of value to an organizer only as an auxiliary—incidentally, a very valuable one.

Let me add one point more, the interior organization of a factory is always very much the same, whatever the nature of the work. When you have organized one or two shops, you have little or no trouble in finding how to go about organizing another. It is only necessary to use common sense.

Wherever *men, machines and materials are to be*

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handled the question of management is always the same.

The following comparison may be of help in illustrating my point:

A suit made for a small man will not fit a large one nor will a stout man's clothes fit one who is thin, and yet, all men's clothes are of much the same type, with practically no important differences, thus:

We can be sure that the same tailor who succeeded in making a good suit for a stout man will no doubt be successful also, when he undertakes to make *any kind* of a suit for *any type* of a man.

2nd Practical Instance Concerning

False ideas about the *nature* and *value* of outside help given by a consulting engineer.

Let us consider another example: Read the advertisements relative to positions available. You will notice how they are labelled. You will find,

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for example, that a *mining engineer* is wanted as a general manager *to organize* the exploitation of lands containing ores, coal or iron.

They think that because *a mine* is to be dealt with, they *must* have a mining engineer. Whether he be a good *organizer* or not they consider it as a matter of secondary importance, the essential thing is that he be a mining engineer. . . .

This conception is indeed utterly false, because to organize the exploitation of a mine, *particularly in the beginning*, there are many questions to be solved—having to do with *mere organization* and handling of problems relative to mechanics, electricity, building, employment of workmen, clerks, draftsmen, and bookkeepers, etc.

These questions cannot certainly be solved by most mining engineers, but must be dealt with by specialists in organization matters.

False Ideas Concerning the Relative Values of Services Rendered by an "Engineer" and by a "Practical Man" in Factories

There is always a pronounced rivalry between an ***"engineer"*** and ***so called "practical man."***

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By the term "*engineer*" we usually understand a man who has graduated from some technical school while the term "practical man" relates to one who has obtained all that he knows about his trade in the factory itself and not in any school whatsoever (except possibly in a night school or correspondence school).

Both the "engineer" as well as the "practical man" thoroughly *distrust*, *hate*, and even *despise* each other.

Everyone of them tries to hinder his fellow worker, to hurt his feelings or his interests, whenever the opportunity presents itself; sometimes he is even *seeking* eagerly the opportunity.

Of course, the general interests of the companies suffer considerably from this state of affairs.

It is evident that the ***title itself*** *does not mean anything.*

In fact, one can be an "engineer" and be ignorant *not only* of *practical* matters, but also of the theory he was taught in school, just the same as one can be a "*practical man*" and nevertheless lack

not only the *theoretical* knowledge but *even* his own practical trade.

I will go further than this and say: Even if the "engineer" know his theory, and the "practical man," his trade, this is not sufficient.

In fact, the "*best theory*," when not backed by a "*good practice*" is as worthless as the "*best practice*" not based on "*sound theories*." In other words, "a healthy theory coupled with a good practice and seasoned by *mere common sense* gives without fail the most remarkable results."

Conclusion. As an engineer and a practical man have to *compete* with each other (if they be not united as one man) it is in the interest, not only of the company, but of each (the "engineer" and the "practical man") to live in harmony and even to *esteem* and to *help* each other. It is in their own interest to do so since each one can always learn something very interesting and useful from the other.

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False Ideas About Layouts of Factories

Some Thoughts Concerning the

1. **Layouts of *new* factories to be erected and the**
2. **Relocation of machines in shops already in existence.**

When it is a question of proposing to somebody a new layout, the following *standard objection* is usually presented:

"I do not believe that a new layout can be of any use to us." In fact, we are seldom manufacturing the same products. To-day we make, for instance, principally pumps and steam engines, and to-morrow we receive orders to build gas engines and we will perhaps have to wait years before we will have again to build pumps, steam engines, guns, cut off machines, etc.

Suppose, the objector continues, "your layout will give splendid results today while we are manufacturing pumps and gas engines, we will be forced anyhow to *relocate* the machines (if not all, the majority at least) in order to be able to

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obtain the new sequence of operations required by the new order to manufacture guns, gas engines, etc."

This objection is not quite right. In fact:

1. *The same kind of work is always done on the same kind of machine.*
2. *The work of certain dimensions and weight is always done on the same kind of machine of certain capacity*, and finally,
3. *The sequence of operations of a given material* (as for instance: lumber, cast iron, iron, steel, etc.) *is always the same.*

To illustrate: If you have to work some lumber, you know that the first operation is nearly always done on a cut off saw. It *happens* that the lumber goes first through the planers, but at any rate in the majority of cases it has to go first through the saw. Or, it will never enter in anyone's head to begin to turn a piece of wood before having it cut to the proper length, no more than anyone would start *polishing* it *before* passing it through the *planer*.

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When this (the planing and sawing) is done, then comes the lathe, and afterwards the polishing machine, etc.

The same reasoning will take place when we will take as an instance iron pieces.

In fact iron will go *first* to the *shears* and after that, it will go to the *forge* and from there to the *drills* (or punch) and from there to some other machine. Certainly, we will *not* begin to *harden* the metal *before* it is made to the right dimension. This means that the first operation is always on the shears and the next operation forge, etc.

It is true there can be sometimes exceptions to the rule, but it is only an exception and not a rule.

The same kind of reasoning can be used when it is a question of the *capacity* of a machine. Suppose we have at our disposal a ***one-ton*** hammer. We, no doubt, will let the hammer work with pieces for which its size is adapted. It would certainly not be possible at all to forge the same

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pieces on a 200 pound hammer and vice versa. Products which could be manufactured on the 200 pound hammer would not be practical, because uneconomical, to send to ***one-ton*** hammer.

There is another objection which is often made. "Some pieces *must* be sheared *after* they have been forged, *i.e.*, that in this particular case, the *first* operation is performed in the *forge* and the *second* operation on the *shears* thus the products have to go *first* to the forge and then go *back* to the shear, as in a perfect layout the shears are nearer the steel yard than the forge. Thus (the objector claims), we lose time and money."

The objection seems to be justified, but in exceptional cases like this, the question to answer is "if these cases occur *very often*, certainly it is necessary to place a second shear at the other end of the forge shop, but if this be not often the case, there is no need to change the location of the shear or to buy a second shear.

In cases like this:

1. We must compare the expenses incurred in carrying the products to the shear and back to the forge shop.

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2. The expense of buying a *new machine* which will be idle most of the time.
3. The rent of the *working space* that the new machine occupies.

   This space could be used for storing materials of jobs ahead for the machines that are located in the neighborhood of this space.

4. Indirect loss which occurs every day on account of interference with the current job.

Rules to Observe When Making Layouts of New Shops

In order to get a perfect layout, it is always advisable (with a few unavoidable exceptions) to place together in a given department all machines of the same kind. Thus, the same kind of operations will be performed at the same place. A result which is most desirable.

To illustrate: All hammers must be kept together and apart from the bulldozers and upsetters, etc. All lathes should be kept together and not let them be intermixed with drills, planers, etc.

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As future extensions of the works must always be provided for, ample room should be left between the different groups of machines. If this rule be not observed, it will result that in case it become necessary to acquire some more machines, they will necessarily have to be placed too far away from the group to which they belong. Thus, there will be machines belonging to different groups located near each other. In other words, machines of the *same kind* will *be spread all over the shop.*

The different groups of machine tools should be placed in such a manner as to obtain the *sequence of operation* when considering the usual method of manufacturing and the most profitable kind of work that will be performed in the future.

Some Ideas Concerning the Re-location of Machine Tools in Old Shops

When it is a question of relocating machine tools it is next to impossible to obtain a perfect layout.

Why?

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Because only in case you have to make a layout

of a factory *not yet in existence*, are you able to put everything where you see fit for the purpose in view. But when it is a question of *relocating* machines you cannot do as you please.

In fact, suppose, for illustration, that some machine tools are very heavy and repose on no less heavy foundations and, moreover, are attached to a certain portion of the shafting by means of complicated counter-shafting, or conveyors and different frames (special system of hammers turret lathes, or grinding machines, etc.) In this case you are obliged to let these machines remain where they are and the result is that you can't have a perfect layout.

Does this mean that no good results at all can be obtained by relocating machines in an old factory?

This is by no means the case. You would not be able to have 100 per cent efficiency, it is true, but you can always obtain the maximum of good results *from a given situation* and this is all that we have to aim at in every occasion.

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The Necessity of Having a Rational System of Management, not only in one, but in Every Department of a Concern.

All These Systems, However, Have to Work Harmoniously Together

This is a Condition Sine Qua Non of Success

In some factories the management has begun to understand the utility of a good interior organization; but even in this case a rational system is seldom *regularly* and *generally* applied. We find that they have timidly tried to introduce a *partial* organization, *i.e.* if there be for instance 10 different departments, you will find that department Nos. 2, 5 and 9 are well organized. But rarely is there a factory where *all* departments are well organized and where all the parts of an organization fit and work together (help instead of hindering each other.) This is because they forget that the mechanism of a factory may be compared to that of a watch, where *even* if all the parts present and *even* if each one separately be manufactured in the most approved way this is not enough to make the watch go. In fact if for instance, the pitch of one gear differ somewhat from

that of its corresponding gear (with which it works together) it is fully sufficient to hinder the functioning of the watch.

False Ideas That Some People Have Concerning Profit

If you look around in the industrial world you are astonished to find how many persons are ignorant of the proper definition of profit.

They say for instance: *It is impossible to succeed at present in that business because, formerly, a given article was sold for $200.00 and now one must sell the same for $100.00, and to make matters worse, it has even to be made better.*

Those who speak thus forget that everything is *relative.* It may be easily possible to make more money at the new smaller price of $100.00 than at the old high price of $200.00.

In fact, take for instance, electric lamps, the same used to cost 15 years ago, ten times what they do now.

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This is because at that time electricity was very expensive. The number of consumers of electrical lamps was very limited and hence, there was also a limited profit (notwithstanding the hugh unit price paid for lamps.)

Now things have changed. Electricity is accessible to everybody, even the poor. Thus the consumption of electric lamps increased so greatly that the manufacturers gain vast sums of money even though the profit on each lamp be very small.

False Ideas Concerning the Reasons of Prosperity of Some Concerns

A manufacturer will often say: "But we are getting on very well, without an efficiency system. The proof is that we are making money as we have done in the past and therefore we have no need to reorganize."

If you examine the matter you will often find that the factory really makes profits but the reason is not because the factory works at 100% efficiency. The cause is entirely different, from what the manufacturer believes.

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Causes of a Company's prosperity due to exceptional conditions.

Their reasons are numerous and variable such as when an article is patented, or the demand exceeds the production and there is practically no competition, or again, it is protected by trusts, or high tariffs, so that foreign competition is eliminated; or even that it is protected by the Government, which only allows loans to foreigners on the condition that they place certain orders in its own country, etc. Loans of Germany to certain Balcan countries, etc., before the war, would be an example of this.

In all these cases, it is possible, within certain limits, to ask any price and so it is not astonishing that the profits are great.

They might have been far greater if rational working methods had been adopted.

Let me consider the case (that most often presents itself) of the manufacture of an article where competition has become very bitter, and in consequence, the profits are very small: Thus, the

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very existence of the industry is imperilled and new methods of manufacture must be found at any cost, new labor saving devices must be devised, new and cheaper sources found for the purchase of raw materials, a simple system of control established, so as to follow the work of manufacture through all its phases and reduce to a minimum all factors that may hinder the progress of the work.

False Ideas Concerning the Expense Incurred in Re-organization of a Concern

Many manufacturers have a more or less incorrect idea of what they should do to reorganize their factory. We may find among them the following current "ideas":

Many imagine that in order to "reorganize," they must overthrow everything that exists, and spend immense sums of money in buying new machines, engage new employees, and print a vast quantity of new forms and other stationery.

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Nothing of the kind is necessary.

It is certain that *in nine factories out of ten there are too many employees*, and to obtain the desired economies and increase of output, there would be no need to increase the number of clerks, workmen or machines.

After studying thoroughly the existing system and methods, it is only necessary to

1. Retain what is good
2. Improve what is too defective and
3. Eliminate what is altogether harmful.

If this system be employed with method and good sense and if a competent, conscientious and energetic head be placed in charge of each department this alone will give very good results.

False Ideas About What Should be the Relation Between a "Boss" and His Subordinates

Shortcomings of Certain Employers

Among those who are possessed with authority (as "bosses" or their representatives) many have no clear idea of what should be the relations between themselves and their subordinates.

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They really do not know what attitude to adopt in dealing with the latter. Often they permit too much familiarity from them.

They let everyone have full liberty to act as he pleases and with little or no supervision.

In other cases they adopt quite the contrary attitude. Sometimes they even vary between the two extremes, not because of any systematic method, but simply and solely because of *their good or bad humor.*

There are some chiefs who say

"We are the "bosses" so we ***must*** be right."

"Even if we be convinced that we were wrong, we *must not admit it* because this would be humiliating and would injure our "authority."

They consider it beneath their dignity to speak to their inferiors except in a severe tone, or even full of irony and contempt. They are always threatening to punish or to discharge the employees.

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They consider and treat their men as veritable slaves without considering their feelings or state of mind.

It is nothing for them to discharge anyone and sometimes even without notice, causing the employee great financial trouble if not actual misery.

A moment of ill humor and so much the worse for anyone who incurs their displeasure. They may later regret their action, but it makes no difference. Once they have decided to do something they will never come back and change their decision for their principle is: that the "boss" must never admit he has made a mistake.

Note—Something similar happens in a locality suffering from an epidemic disease (such as cholera). You meet an acquaintance in the street and he buttonholes you and says: "You knew Charley, didn't you? Well, he passed away!"

"Passed away!" you will exclaim, "You don't say. I saw him no later than this morning and he seemed to be as strong as a mountain rock."

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"Alas, it is a fact, dear friend, our Charley is no more!"

Similar stories you will hear constantly and everywhere. In fact you will become so accustomed to these stories that you will (I would not say, "miss them") be surprised should you no more be stopped by friends who have to inform you about the sudden "disappearance" of your friends and acquaintances.

Something identical happens in a ***"volcano" concern.***

Not one day will pass without somebody being "fired." In the morning you go to attend to your business; you meet one of your co-workers, and have a nice little chat about election, base ball, an automobile ride, etc., and a couple of hours later you are informed that he is "*kicked out.*" The reasons? What is the use of knowing them since nothing can change matters? Everything is over and for good! But, if you care to investigate at least *one* case of "*kicking out*" since all others are similar, you will come to the

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conclusion that while the "boss" and his "victims" considered their "scrap" as being justified by very weighty motives, you, the outside onlooker, find all the story very foolish, if not criminal since it is based on *misunderstandings*, and nothing else.

Misunderstandings are the very *foundations* on which are built up the courts of justice, prison and even the electric chairs.

I do not say that the boss is *always* wrong, but I do not say *either* that he is always whiter than snow.

Some time (or often) it is to the door of a bad system of management that the responsibility is to be brought back.

This is not only unjust but it is harmful to the interest of the company. There can be no doubt about that. In fact, if the man they discharge has faults, so has the one who takes his place, and it is by no means sure that his faults will be much less serious.

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In any case, it is certain that the "*old hand*" has certain practical knowledge of the methods of doing things by the company which the new one will lack.

What are the results? They are very far from being satisfactory. In fact, since nobody is certain of being promoted according to his merits, or even of holding his position, everyone considers himself as a temporary employee and thinks it useless to take much interest in the welfare of the Company.

Consequences of Not Keeping Promises Made by "Bosses" to Their Employees

Some manufacturers find it useful to make promises to their workmen or other employees but by no means do they find it necessary to keep them. Often even (at the very moment when they make their promises) they are looking for a way to evade them.

Here also not only is it dishonest, but it is also harmful to *their own* interest.

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In fact, this cannot be kept a secret. Those who

suffer from it complain to everyone who will listen.

Everyone therefore soon comes to know this way of acting of the manufacturer since the newly engaged workmen or employee are at once told all that happens in the factory.

The other men take care to communicate to the newcomer this information, sometimes they do it openly, sometimes by means of anonymous letters. (This is a very common method in factories so far as I have knowledge.)

It is, therefore, no wonder that the "bosses" or other superiors having acquired a bad reputation find that instead of being on good terms with their workmen and receiving from them the marks of respect and esteem, they are surrounded with enemies, or, at least, with those who are indifferent to their interests.

I strongly advise the employers that they should always talk clearly and simply with their subordinates so as to be easily understood.

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They should avoid "diplomatic" phraseology, which always hides something and no one is deceived by it. The only result is that the subordinates are likely to become suspicious and not to believe them even when they speak the truth.

Furthermore I would like to finish this chapter by saying to the heads of factories, if they wish to have as little trouble as possible with their men they should constantly try to show them, by *acts* instead of *words*, that they are *frank, sincere and just*, and are not merely trying to exploit them.

In so acting they will not only be respected, but (I am firmly convinced), will be rewarded by a sincere devotion. Moreover in many cases the men will not be aroused against them even if sometime they should be absolutely rigid in their insistence on complete and punctual fulfillment of duty.

In the beginning this attitude of the employers will be mistrusted, and for *some time* it may be regarded with suspicion, but this will pass, and

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in time the management will be able to succeed in securing the confidence of their employees.

Do Workmen, as a Rule, Like Their Trade Just the Same as Professional Men Do?

Are Some Labor Leaders Trying to Develop Among Their Followers the Sentiment of Duty and Honor Jointly With the Sentiment of Right?

I ask those who *guide* and *counsel* workmen, why do they always talk to them about their *rights*, and never, or in any case very seldom, about their *duties?*

I do not believe that the "conscious comrades" say to those comrades who are less conscious.

"Begin by doing your duty loyally and fairly;"

"Learn and like your trade;"

"Be sober, punctual, speak nothing but the truth, and,

"Appropriate neither tools nor anything else that is not yours."

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"No matter whether others sympathize with you or not; make them, at least, respect you."

"As for your rights, don't worry about them."

"We are there to defend them by all the means at our disposal. But we can defend them all the better *if* we, ourselves, are convinced that *you* do *your* duty."

I am firmly convinced that if this were the case, not only the superintendent, foreman, etc., who is himself an employee, but also the owner of the shop, would understand and would often find perfectly justified the request for increasing salary or any other favor.

Even suppose that if the workman's request were granted, not because the "boss" is animated or inspired by the spirit of justice, but from self-interest. "You should worry . . . !" will say a good American, the results aren't they just the same?

Let us analyze this question a little more closely, for I consider it worth while.

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I blame the workmen for not liking their trade, as do most of the engineers, technicians, and draftsmen (I say, engineers, technicians, and draftsmen as I might have said: doctors, lawyers, accountants, or almost anything of that sort).

It is decidedly rare that an electrician for instance (to take an example from among the most intelligent and best paid class of workmen), will say as he comes home in the evening:

"I am satisfied because I have done a good day's work, or

"I am happy that my work has turned out well."

And yet there is no doubt that these workmen are in general far more happy and contented than engineers, draftsmen and technicians could be.

Although engineers have had to make a sacrifice of the best years of their life and spend a lot of money, yet very few of them arrive, in the course of their career, at the position of president,

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member of the board of directors, or general manager.

The majority of engineers pass all their life as subordinates, at a very modest salary.

These "salaried engineers" are nothing but "intellectual workmen" whose positions are moreover less stable and relatively profitable than that of the ordinary mechanic.

Suppose we try the following experiment of suppressing momentarily all supervision in a factory. In so doing we will find that either the workmen will do nothing, or at any rate—nothing useful, and this is due to a complete *lack of the sense of duty* and even to a stupid and unjustified maliciousness.

This gives me the right to say that the workman s "conscience" bothers him very little when the interests involved are those of the "boss" and not his.

In support of this statement, I wish to cite a few examples that I have seen.

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I have observed these matters in three different countries, and found no difference whatever between them.

First Instance

Coming into one factory, I found that the electrician in charge of the travelling crane was amusing himself by picking up iron pigs and dropping them on the iron pavement of the shop. Each time the pavement slabs were broken, the onlookers, the workmen, roared with laughter. I could clearly see that they took great pleasure in causing damage. I did not notice, however, that any "class conscious" found it necessary to protest and to stop this act of vandalism.

Second Instance

In another country, I found mechanics who had nothing better to do than to hammer their lathes out of shape to revenge themselves on the foreman, because of a reprimand that after all was absolutely just. But since it was very easy, in this particular concern, to "obtain the ear" of the "boss," was there any justification for the vandalism committed?

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Third Instance

In order to annoy one of their comrades, they deranged the working of his machine, so that the work turned out was defective.

Fourth Instance

In another factory, the workmen damaged the machinery and the finished products ready for shipment, simply in order to make trouble for the "boss."

I have often seen similar events occur, and have never noticed the slightest sign of disapproval on the part of the other workmen.

Finally, let me cite the following example:

It was formerly customary in Europe to search the workmen as they left the shop.

At the present time, however, this is rarely done. It has been decided that this is humiliating and degrading for the workmen.

But have some workmen ever tried to be worthy of the confidence reposed in them? One may well doubt it.

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Some of them steal as much in the factories as ever. It is a fact, however, I have never noticed that any of the other men try to stop them in any way, or to show their disapproval.

And still less have I ever known either of a case where workmen demanded of the management the *discharge* or, at least, the *reprimanding* of one of their comrades because of dishonesty or theft, nor have I even known them to exclude from their society those guilty of improper conduct.

I have already said that workmen do not like their trades: this is so evident as to be indisputable and it is therefore not astonishing that they *consider their work as a sort of punishment. Thus the time in the shops never goes fast enough for them.*

Every minute seems an hour.

They always try to avoid doing their duty. Instead of trying to do their work as well as possible, they watch eagerly for moments when the supervision is lax so they can stop work.

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All this is most unfortunate, not only for the interest of the concern but also for those of the workman himself, for these mechanical trades, if one like and take an interest in them, he can find a consolation, a comfort and even a great personal satisfaction.

Hostile Sentiment Stubbornly Maintained by the Management Against the Socialists Caused Much Trouble and Loss of Considerable Time and Money

First instance, First of May

Here are a few typical examples, unimportant in themselves, but which were nevertheless capable of producing general dissatisfaction and almost causing a strike. In the meanwhile, they paralyzed, for a long period of time, the workings of an important concern.

The representatives of the unions had asked several times that the workmen who were absent on the first day of May (this day being a Socialist holiday) should not be punished; and, better still, that the shops themselves should be closed for the day.

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The manager never considered it worth while to grant this demand, so that every year at this period there was trouble.

In spite of the order forbidding absence on this day, a large number of men were always missing.

As the work was disorganized by these absences, those who were present were able to accomplish very little.

Moreover, the next day the refractory workers had to be punished, if only to preserve the "authority" of the management, or there were always some of the workmen who preferred to leave the factory rather than to accept a punishment.

The worst of it was that those who left the factory were usually the *best workmen* thus the best men were lost while the mediocre ones remained.

In this way the factory suffered greatly, since the work was disorganized for long periods, and consequently there were very serious troubles.

Besides *the direct* losses I have mentioned, the management incurred the animosity of the union

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leaders who avenged themselves in the following manner:

All orders, without exception, were criticized as a *matter of principle* to the disadvantage of the factory.

I saw at once that this was a useless and expensive struggle for us, and that, after all, the men were not altogether wrong in wanting their holiday. Thus it was a great mistake in refusing it to them. I therefore posted a notice authorizing the men (if they wished) to be absent on the first of May.

As no great effort is necessary to persuade employees *not* to work, I suppose the Socialists had little difficulty in converting the *indifferent* men to their "point of view"—so that on the following first of May only twenty men (out of five hundred) came to work.

The Socialists were greatly pleased to have had this occasion to show their force, and claimed that it was a great victory for their cause.

For my part, having made this concession, I took my "revenge" by being more severe in other

matters, such as absences on Mondays. I did everything possible to dissuade the workmen from practicing the "blue Monday" which was extremely liked by them.

Since the men no longer felt themselves backed by the union they were obliged to give in.

Second Instance

Some Commodities for the Workmen

As another example, I may cite the following case: For a long time the men had asked, without result, for a special dining room where those might eat who could not go home for lunch. They also asked for places for their bicycles, awnings on the windows, better heating during the winter and means for preventing draughts.

For a very small sum all these demands could have been satisfied, but the management insisted on the most rigid "economy." So that, in this case also, it has caused a general dissatisfaction among the force, the consequences of which were far more expensive than if we had granted their demands.

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Since I consider the company morally responsible for the health of the men, and, as moreover, it was to the company's interest to watch over their health and make the living conditions for them in the shop, as comfortable as possible, I at once granted all these demands, which moreover cost the company relatively very little.

On the other hand, the conciliatory and humane attitude, on this occasion, won the company the friendship and gratitude of the men, and thus it prepared a *ground favorable* to the growth of any other enterprise in the field of our factory doings.

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FALSE IDEAS ABOUT EXPERT ACCOUNTANTS

Asking the Advice Relative to the Determining of *Cost* is a *Costly* Mistake.

I think that it is an error to consider that industrial bookkeeping should be organized by an expert accountant. No matter how clever and capable he may be, he will never be able to organize it properly. Industrial accounting is very difficult and delicate and it requires rather a technical than a commercial training. It is not enough indeed to designate clever tabulations and ingenuous lists to make it work well.

For as soon, for example, as one changes the working method or invents a new device for the shop, at once a change in the bookkeeping becomes necessary.

This can only be done by one who is in constant touch with the *actual* work of manufacturing.

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This cannot be otherwise since the bookkeepers never come into the shops (and if they did it would not make much difference since they have not the technical knowledge necessary to understand what is going on) *how* can they be expected to attend to *industrial accounting* with some shadow of good results?

If already a good organization exist they can make use of it, but if it be not yet organized, they certainly cannot be expected to *create* it.

It takes an industrial engineer to do it.

Practical Instance

Of an Impractical Expert Accountant.

This practical instance will show that an expert accountant is not "the right man in the right place" when it is a question of determining the manufacturing cost of a given item.

I have seen a very funny thing happen in a factory. The chief accountant was very proud in showing me how everything in his department goes very smoothly, and how he has columned his books with very interesting headings for every

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item, and for every expense, even though it be a few cents.

After I had gone through the factory it did not take a very long time to see that the *basis* on which all the figures of the accounting department was based was totally lacking. In fact, I noticed that the checking of the *quantities* as well as the *quality* of the materials, semi-finished and finished parts was absolutely neglected.

By way of illustration, suppose there be an order given to the forge shop to make ten thousand pieces of a certain type. These pieces are submitted in the forge shop to four different operations. From the forge they go to the machine shop, and from there to the erecting department, etc.

It happens very often that the workmen who perform the *intermediate* operations are paid not for *ten* thousand pieces, but for *fifteen* thousand pieces. (Remember that there were only ten thousand pieces in all.) How is it possible? This is very simple. The checker, instead of counting the pieces took the word of the workmen, and

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paid them according to the number of pieces that the latter declared having done. . . .

If I had to go further in my investigation I would find that the number of the pieces which finally reached this department was very far from being ten thousand pieces. In fact while many of them were scrapped by the workman himself, some were rejected by the foreman. Finally, the customer also has generally an inspector who rejected a great many pieces.

If I had observed the rejected pieces, I would have noticed very easily that the pieces had been rejected because they were scrapped, not in the *last* operation, but after say the *second* operation.

What does this mean?

It means that the pieces which had been scrapped, and *should have been* thrown out immediately after the second operation, were allowed to go through all other operations and hence the factory

paid more wages to perform still more operations on pieces *which should have been scrapped long ago.*

Am I right in asking: "*What is the use of the accounting department and its special system of ingenuous column of headings?*"

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FALSE IDEAS ABOUT ECONOMY

Is it advisable for any manufacturers to make their own tools, devices, etc., or is it more economical to order them made outside, even though you can "save" the profits that otherwise you have to give to another manufacturer?

In one of the factories where I have been engaged as consulting engineer, I advised the management to buy some new devices for the purpose of increasing the output of an item manufactured in large quantities.

The works manager proposed to me to make the devices in his own die and repair shop.

He claimed to be able to manufacture them more economically. He added that it is better to save for the company the profit that otherwise he would have to give to another company.

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He promised to have them delivered in the course of two weeks, but as he did not keep his promise, I went almost every day to the works manager.

I wanted first to have my devices finished and further I was interested in seeing how he handled his men and what kind of system he used to insure keeping his delivery dates.

I took the works manager by his arm and asked him to come with me to the die shop. While I attended the meeting of the works manager and his foreman I listened attentively to their conversation and studied the expression on their faces.

I felt that both had been *sincere*—they wanted to give me satisfaction—but what was the use since they have been unable to give me the devices that I needed badly. This, of course, is to be attributed to the lack of a suitable system of organization.

It seemed to me interesting, because instructive, to cite as a ***characteristic instance of handling of men,*** the manner how the works manager

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gave orders to his foreman and how the latter took care of those orders.

The works manager, each and every time he came into the office of his foreman, called the latter by his christian name. "Hello Charley," and began first of all to ask if he had something to chew. After this, the conversation had been going on about sports, weather, or some other "interesting" questions of similar kind.

The works manager acted so not merely because he liked very much the foreman or he considered him as his equal—no—not at all. I had the impression that he did it with the purpose of putting the foreman in good humor, since the works manager was always afraid that the foreman would quit if bothered too much.

Similar cases happen *always* and *wherever* a "boss" doesn't know thoroughly his business and depends for everything on his foreman. Similar "bosses" are to be considered as "*drivers*" and not "*leaders*."

To-day the same boss, when he believes the foreman to be *absolutely indispensable* and irreplaceable, pats him on the back and even humiliates himself before the foreman. But as soon as conditions

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change, and the services of the foreman no longer appears to be of such value, at once the "driver" will change his attitude as per magic.

From too friendly and too familiar as it was, the relation will become strained and the "dear Charley" will be thrown out pitilessly.

The boss will be the more cruel with the foreman, the more he had to pat him continuously in the past.

If the works manager had known his business and *how* to handle men he would have been able to keep *always* a *firm* and *dignified* attitude in his relation with his subordinate.

If it happened that the latter was absent from his department (and this was by no means a very rare case, since all foremen are constantly running from one department to another to "chase" somebody or something) the works manager would send the office boy after him, but in the meantime he went direct to the locker where the foreman kept his clothes, searched the pockets and took whatever he found: apples, oranges, chewing tobacco or similar things.

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As soon as the foreman appeared, the works manager said to him, after, of course, he has finished with the classical "entre en matiere" about sports, weather, etc. "Hello Charley, how are things going with the devices?"

While passing through the shop we saw that the work had not been advanced very much.

I asked him:

"When do you believe you will be able to finish them?"

The foreman unhesitatingly "*shot out*" a date at *random.*

The manner in which he gave his delivery date showed that he has no reason whatever for giving this date rather than another date . . . we, the works manager and I, could very well say that we could not rely upon this promise.

To finish in the best manner our conference about the devices, the works manager said to the

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foreman, "My dear Charlie, please, be kind and finish the device as soon as possible in order that our consulting engineer might be satisfied. You will do it, Charlie?"

When we left "our dear Charlie" we had the promise repeated that without fail the requested devices would be ready for the new "delivery date."

But as "our dear Charlie" has been probably "busy," as soon as we left him, in a similar conversation with another chaser of something (assistant manager or even the vice-president himself), the "dear Charlie" totally forgot us with our requested devices, and I had the opportunity to come over and over again accompanied by the works manager and attended the same or similar kind of conversations many and many times before I finally had my so much desired devices.

Had we ordered the devices *outside* or had there been in the factory a better system of determining delivery dates and in general more rational working methods we would *not* have lost so much time and had so much trouble.

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HOW IT IS EASY TO ECONOMIZE

You Can Save at Least from 5 to 10% of the Running Capital Simply by:

1. **Not Buying Unnecessary Material, and**
2. **Not Selling as "Scrap," Materials Which Can be Easily Utilized**

To illustrate, it is sufficient to cite only the following:

Buying Too Many Materials

I imagine reader that it sometimes happened to you the same as to me, namely; before you leave your dwelling in the morning you are inquisitive to know how much money you have in your pocket and it occurred to you (on your return home that evening) to begin for fun, to count your money to ascertain how much you have left.

Very often you are surprised to find out that the difference between the two amounts is appalling.

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If you have the desire to investigate the matter in order to know what you have done with the money, you will discover with amazement that almost all the money spent was to buy things which have been more or less useless to you, in other words, you could get along very well without purchasing these items.

The same happens in the industrial world. In some factories everybody has the right to make requisitions. They can ask for everything that they believe to be in need of, immediately, or, in the near future.

If you insist on knowing if they really be in want of the pieces, they will give you the standard answer, "Oh, you know, we always need items of that sort."

In certain factories which have the reputation of being well organized, these persons are at least obliged to send requisitions to the purchasing department and the latter takes steps to order outside the items according to a given system more or less efficient. But in a great number of factories, most of the *foremen* as well as the *head*

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of all other departments are permitted to order direct *everything* they want, *when* and *where* they wish.

Concerning the question of prices, deliveries and so on, these are generally considered of no importance or at any event nobody cares for obtaining the best buying prices for a given quality—sometimes nobody cares even for the quality.

Useful and Costly Items Sold as Scrap

The same that happened with the ordering of supplies, happens equally with the selling of scrap, discarded machines and so on.

If you be inquisitive to see *what kind* of things are sold in factories, as scrap, it would not be difficult to see that the machines sold as worn out or as useless are very far from deserving to be considered as such.

The same, you will find, among the scrap iron, countless pieces of *high speed steel* which have been thrown there by "mistake."

If you go to the bottom of this affair, you will find

that no person has bothered to check up the correct *weight* or the *number*, etc., mentioned in the invoice. (Their fingers are too "greasy" . . . thus they can do nothing of the kind.)

As far as can be seen they (the factory employees) throw everything that is within their reach into the freight car regardless of its value.

I saw lately in one factory a freight car loaded with so-called scrap. I found that there had been thrown numberless heads of lathes, parts of drill machines and so on which never had been used before.

As everybody knows, these devices are always provided with standard fixtures in order that they may be adapted to every machine. This will enable the junk dealer to sell to *other* manufacturers or even to the *same* manufacturer as "new" these same devices after they have been cleaned with kerosene. . . ! !

As another illustration, I shall cite the following: A factory has been heated in the winter time by means of large cast iron stoves. In summer time

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the stoves had been removed from the factory, and, as usual, thrown out carelessly in the yard. There had been more than a hundred stoves lying out all summer exposed to the inclemency of the weather.

Once, when I was going into this factory, I saw these stoves loaded in a freight car mixed with other "scrap" of *similar kind* ready to be sold as junk.

As the management did not have any intention of introducing a new system of heating, you can be sure that the next winter, the purchasing department, or someone else of the officials (according to the system existing in the factory) has been requested to buy, for the coming winter, some other hundred of stoves. It is not unlikely either, that the same junk dealer offered to the same factory to *re-sell* them their *own* stoves, which he had purchased from them several months ago.

I am sure that similar things happen in the majority of factories, and, I am sure, also that the management in most factories consider questions

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of this kind as of almost no importance and beneath their "dignity" as being too small to deal with.

If the general manager take the trouble to investigate at least *now* and *then* all requisitions and invoices, especially those for materials not concerning current orders, he will have the same feeling about the purchasing of these materials as *you, reader, have about the purchasing of things for your own personal use.*

To the objection that it takes too much time to check up the requisitions I will say that not more than two or three minutes is required for each one, and since very large sums are sometimes involved it is well worth while to follow my advice.

Besides, if everybody in the factory knew that the "boss" is *liable* to look into the matter, if not always, at least sometimes, they will be more careful.

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MISMANAGEMENT

There is rather a lack of knowledge of how to make use of labor when there is a shortage of same.

To illustrate my ideas, I will compare the management of a factory with that of a household.

As far as the principles of management are concerned, there is very little difference between them. If there be any differences, they bear out my conclusion further rather than otherwise.

In the factory you work hard all day and risk your health, or position; surely, housekeeping costs considerable, but how much *more* does it cost to maintain the average factory than the average household?

As you are liable to make more mistakes in the factory than in the household, the consequences of mistakes made in the factory will be therefore

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much more costly than those made in the household. Hence, the particular necessity of having the factory kept always in order, is still more important than is the case of the average household.

I would like to cite some instances which will show clearly how all kinds of waste of labor occur in factories every day and all day long.

Although these losses seem to be of no particular importance, and yet they really represent large sums of money, and no person seems to care to take steps to prevent them. I will, therefore, divide this chapter into three parts:

1. Waste of labor and the nature of same.
2. How some managers look upon it
3. How it must be looked upon.

1. Waste of Labor — Nature of Same

First Instance

In a factory where I was engaged in the reorganization work, I passed near a place in the forge shop where holes had been excavated. These

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holes were destined for two new steam hammers, bought by the Company; the foundations were located near each other.

I saw two workmen busy emptying filtered water from one of the foundations. One of the workmen was located in the hole and was filling a pitcher with water; he then handed it to the other workman who was standing above; the latter did not find any better way than to empty the pitcher into the hole of the second foundation.

As the holes excavated for these foundations were of large dimensions (15 square feet by 10 feet high), the reader will readily understand how long it took to empty this immense reservoir.

What I had seen reminded me of my journey into Egypt. I saw there, namely Egyptians busy all along the Nile draining water for irrigation purposes.

These Egyptians are working at the same job all day long and day after day. This method of irrigation is probably the same as that in existence in Egypt five thousand years ago.

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I confess I do not know where to find the difference between the Egyptian "working methods" and those of these Americans. If there be any difference it is certainly altogether in favor of the Egyptians, since every emptied pitcher was *useful* (from the point of view of irrigation). It was *slow*, it is true, but extremely useful anyhow. On the other hand, the same could not be said about the emptying of the foundation, since the water of the *second* foundation had to be emptied *again*. The emptying of the water in the second foundation was more harmful than anything else.

I know very well if I had investigated the case in order to ascertain why this job had been done in such an inefficient manner (to be clearer, if I ask for instance, why did they not use a steam, electric or at least a hand pump) they will answer me as follows:

"Well, we have a pump somewhere but we do not know where" or "the pump is there, but one of the pieces was broken some time ago, we sent an order to the purchasing department but the piece is not yet to hand."

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I will cite now, some kinds of answers, but I would not have the slightest trouble in citing you hundreds of answers that they would be able to give me.

Suppose I see the man who is responsible for the work and ask him his reasons for this undesirable state of affairs. He will probably excuse himself by saying, "It's not my fault," someone else is to be accused (the purchasing department, for instance).

If I be inquisitive enough and will possess the required amount of perseverance, I will ask information from the purchasing department.

They too, will find an excuse and even sometimes a good one; they would say, for instance, "The fault lies with the pattern maker, in fact, he did not furnish a pattern at the right time" or perhaps the foundry is to blame for not having delivered the above named piece at the right time.

Again, if my perseverance be not exhausted and I would like to get to the bottom of the matter, I will ask for information from either the pattern maker or at the foundry; they, too, will

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find excuses, which, sometimes they will be reasonable and sometimes not.

From everything I heard or saw during my investigation, I am forced to conclude that *everybody is at fault or else nobody is to blame.*

Why?

Because, in my opinion, *where mismanagement exists, it is impossible to do anything right.* Even those who have the will to do their best, lose their courage if they are always and everywhere handicapped, they also begin to "work" as the others.

Second Instance

I noticed that several laborers had been busy lifting small pieces of wood and carrying them to be burned in the boiler. As one can readily understand, the laborers, as usual, had not been in a great hurry to do this uninteresting job. They lifted the small pieces of wood very slowly. This created in my mind the idea that the money

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expended as wages is a hundred times more than the value of the pieces they lifted.

It is still possible that some of the foremen of the Company was very proud to show to the Management that they were able to "economize" in this way.

If I had something to say in a factory where such a "model" system of "saving" exists, I would prefer to allow the poor workmen to take home the pieces of wood *gratis*.

In this case, even if it be sometimes doubtful that the workmen would be thankful, I would at any rate be sure to save the wages uselessly paid for the labor of gathering this wood of almost *no value*.

Third Instance

Here is a similar instance, lately I saw in the same factory several workmen busy removing small piles of earth that had been distributed all

over the yard of the factory; the piles were about twenty or thirty feet apart one from another.

The workmen, instead of going from one pile to another with the wheelbarrow in order to remove these piles, acted in the contrary; in fact they lifted the earth by means of shovels and carried the shovels very slowly to the wheelbarrow which had been placed at quite a distance from the debris.

Fourth Instance

To prove that similar cases may be found in all factories, I will cite an instance which I saw lately in one of the largest factories in the United States. I saw, namely, several laborers carrying some quantity of coke in wheelbarrows; I was inquisitive enough to follow them to the *source* and also *destination.*

I noticed that the destination of the coke was the steel hardening department and as the place where the coke was stored was about 300 yards

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distant from the destination, I did not see the reason why the management did not keep the supply of coke nearer the steel hardening department, in view of the fact that available space for such use could be noticed near this department.

The following thought came to my mind:

What would we think of somebody amusing himself hunting birds with large Howitzers? We would say: "the man had lost his reason."

Now then, what is the difference, may I ask, between this man and the man who is in charge of the laborers in the four above-mentioned instances?

Fifth Instance

In my office, in a factory where I was busy with organization work, I found it necessary to have a partition put in one corner. There was in the office a partition that was of no use and

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could have been removed to the desired location with some small alterations. I asked the cabinet shop department to do the job after working hours.

The next day when I arrived at the office I found the partition was no longer there but lying in a *broken mass* before my eyes.

I expressed my surprise at this spectacle and I was still more surprised when I noticed that everybody considered as absolutely normal this "method" of removing same.

Sixth Instance

One time I had to find a place to store temporarily some machines waiting to be erected. I took a walk through all the small buildings spread all over the factory.

In a corner of one of these buildings I was surprised to find about 25 laborers smoking and having a friendly conversation. This was about

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10 o'clock in the morning. If they had anything to do in this building I could explain what I saw by the fact that the workmen had taken a momentary rest, but it was clearly seen that they had *nothing* to do *at all* in this building, and this, as we can readily understand, aggravated the matter.

I will emphasize this case especially, for the reason that the master mechanic, the boss of the workmen, always contended about his inability to undertake the repairs to machines on account of the lack of skilled labor.

Just the same, I was aware they suffered a great deal in all other departments on account of shortage of skilled labor. The delivery of munitions to the Government was greatly hindered, the erection of shafting in a new machine shop was delayed for months, and numerous other jobs were not done for the same reason—the lack of skilled labor.

I am sure everybody will agree with my statement, that a *great part of the trouble*, as mentioned above, is *not due to the lack of*

labor, but to the lack of knowledge of how to use labor.

It is interesting to mention a bonus system which the master mechanic proposed to the general manager as worthy of being introduced into his department, and which the general manager handed over to me asking my opinion of the same.

The system consisted of giving a bonus representing 10 per cent of the salary of the workmen under his supervision, who would be "kind enough" to come to work punctually every day (in the morning) and remain throughout the entire day until the whistle blew.

In order to make this system more attractive to the manager, the master mechanic claimed that this "*system*" had been tried out successfully in other American factories.

2. How Some Managers Regard Waste of Labor

The following conversation which I had with the general manager of a company (where I was

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entrusted with organization work) you will find, I am sure, extremely instructive.

I pointed out to this gentleman that waste of huge sums of money occurred in his factory every day, and this is to be attributed to the lack of a suitable system in handling labor, which is all the more regretable especially *now* that the factory is suffering from the shortage of labor on account of the war.

To prove to the general manager that my statements were correct I cited to him some instances similar to those set forth above. The general manager's expression turned from friendly as hitherto, to anger.

I am unable to repeat the words he told me and it is beyond my ability to describe the expression on his face at that time. All that I can say is that his expression was anger seasoned with a bit of irony.

He said about the following to me: "But, Mr. Meron, I cannot understand how such a big man as you can pay attention to such small things as

these." The general manager gave me the title of "big man," but what he really wanted to say was:

"But, Mr. Meron, you know that I am a big man and as such, I have constantly large problems to handle. I cannot see, therefore, how you could ask me to waste my time in bothering with such small details as these."

This answer, disagreeable as it was, did not, however, discourage me at all.

A consulting engineer has not the right to be discouraged every time someone does not agree with his opinions. Should he become so, it would greatly harm his interests as well as the interest of his task (organization work).

He certainly has not the right to be of the "I should worry" type but what he should possess, in my opinion, is an immense reservoir of energy and philosophy (this means patience and forgiveness), from which he must be able to draw the necessary amount of the above mentioned

virtues required every time he has to convince someone *who does not want* (or even is *not able*) to be convinced, of the indisputable facts that two and two make four, no more, no less. . .

We will now come back to my conversation with the general manager.

I asked my opponent (with the kindest smile that I was able to produce at that time), the following questions:

"Have you a small note book and pencil in your pocket?"

He asked;

"No, Why?"

I retorted:

"As a rule, in well organized factories, all heads of departments, especially the general manager, must always have in their pocket a note book and pencil in order to be able to note everything that they may see on their inspection trip, that they must make at regular intervals through the factory, at least once a day.

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This enables them, as soon as they get back to their office to study everything that they may have seen during their trip."

> ***Note***—I did not confess to the general manager that I myself am not able to form the habit of carrying a note book and pencil, although I need them very badly. I act like the preacher who said to his congregation: "Do as I advise you and not as I do myself."

"Please," said I to the general manager, "can you grant me a half day?"

He said, angrily:

"How can I afford to *lose* half a day?"

"I am very sorry," I retorted; "to contradict, however, I am obliged to inform you again, that in my opinion, *a general manager has not the right to work himself, especially the kind of work you are doing, because one of your clerks well versed in this business will do it much quicker and much better than you can do it.*"

My advice can be justified in the following manner: If you will compare *his* salary with *your*

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salary, you'll agree with me that the company will have much more profit if the *clerk* spend his time on the same job as *you* are doing here.

"Concerning this half day you are afraid to "*lose*," let me tell you, that in case you have never lost half a day in your life, you can well afford to lose a day now and I am sure you will not regret it.

"What we are going to do is very simple.

"We will go through the factory and, as soon as we will see a case similar to instance number one, cited above, you will take your pencil and note book and make some calculations of the following nature:

"How many men are there?

"*What kind* of work, and *how much* have they accomplished all day?

"When we are through with the first instance we will go to the second and the third, and so on (we can be sure we will find hundreds of instances similar to those cited above which occur every day and all day long in every corner of the factory).

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"After the trip is finished we will return to your office and ask for information from your production and other departments (exactly the same as was needed when we considered the first instance; the *number* of men. *wages*, *kind* and *amount* of work, etc.)

"We will then be able to find out *what this means in dollars and cents;* in other words, we will find in one instance we lost, say, ten or fifteen dollars, while in another case, the loss will be much more; since hundreds of similar instances occur daily in the factory, you will believe me, when I say that thousands of dollars are wasted every day, which means that the end of the year finds the unnecessary losses amount to a very large sum: hundreds of thousands of dollars, perhaps.

"*Please tell me, who has profited from all this mismanagement?*

"*Is it the shareholders, you, the employees or the workmen?*

"*Nobody!*"

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3. How Waste of Labor Should be Looked Upon

"Please ask yourself what you are able to do with this sum, how splendidly you can use this money in the field of improvement—of the general conditions of the factory?"

To illustrate: With the savings you can buy many new machines and devices, install splendid store rooms, raise the salaries of your employees, or give a bonus to all those who give you their best and sincere co-operation, etc.

Now then, I will go further than this in saying the following to you (as well as all your employees):

"You spend *most* of your lives in the *factory* rather than in your homes.

"In fact, you only come to your homes for a comparatively short time, to eat, sleep, and for some recreation, comfort and enjoyment.

"In this case, why should you not take the money saved from wastage and spend it to procure recreation and comfort for yourself as well as for all your employees?

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"You could install, for instance, a kitchen and dining rooms where all the employees could get a clean and substantial meal worth the money he paid, rest rooms, recreation grounds, reading room, library, etc.

"I am certainly far from being a preacher or a 'philanthropist' with the money of others. I am talking from a point of view of good policy only. *Now, everyone considers the factory as a jail, where he is obliged to go at the proper time, begrudging the time he is there.* During all the day he lives in anticipation of the closing hour. Now then suppose for a moment that everything that the factory affords will be more attractive and *more comfortable than his earnings would permit him to obtain home*, he would forcibly compare, in his mind, the vast difference, which is to the credit of the factory, and he would prefer the factory to his home.

"He would at least go to work each day in better spirits, and his work would show better results. There is no secret to anybody that everybody works better when he is happy."

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Compare in your mind, two factories:

In ***one factory,*** no waste is permitted. Rigid account is kept of even the smallest item, and every person has to answer for his time every minute of the day, but on the other hand, the management has provided their employees with a sanitary factory, good light, heat and the comforts we have just mentioned.

Now we will take the ***second factory,*** where everybody is allowed to do as he pleases; accounts are scarcely kept of anything. The employee can be lazy, careless, spoil everything he wants to and, on the other hand, he has not any conveniences, the place is not properly ventilated, not sanitary and no comforts whatever, this man will certainly not be as contented as his fellow workmen in the first factory, who are working steadier, more accurately and in a happier environment.

Better than this, while all the employees of the first factory, which is well organized, *are proud* to say to everyone that they work in that place; the employees of the second factory on the other hand *are ashamed* to admit that they work in such a

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"bum" factory and always consider their position as temporary, in other words, as a makeshift until an opportunity will arise when they can better themselves.

Please note that some of the American factories have tried out this system, and all the general managers are the first to claim that the result has surpassed their most daring expectations.

I will go further than this and say:

"Do whatever you want with this money, but, for goodness sake, do not allow it to be transformed into mud."

Besides this you ask me *to introduce new rational working methods, but how can I think about refinement when such things as those cited above exist in your factory?*

I can only compare this case with the following: suppose you find in the street a beggar, ragged, drunk and hungry; will you have the idea for one minute to take this man, put him immediately in evening dress, take him into a drawing room of one of the most aristocratic families and finally,

would you be foolish enough to say to this hungry man, "If you want something to eat or drink, here you have at your disposal all kinds of French pastries and champagne?"

Would it not be more logical if you began first to clean this man, and give him after that a simple suit, and give him, instead of pastries and champagne, substantial food, and finally, not introduce him into the best society, but after a time if you saw that this man commenced to behave, to live a better and cleaner life, if again you could see from his *actions* that he was forming better habits, that apparently he had saner ideas, and also that he was pleased and interested in his progress upwards, and finally, that he has *the will to persevere in this direction*, then, and only then can you begin to think of introducing this man into better circles.

The same as we say about this man, we can say about your factory. The atmosphere there is very unclean; bad habits such as laziness, carelessness and even worse than these are to be seen everywhere.

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Every man, although he makes serious mistakes himself, nevertheless, when you speak to him he tries to impress you that *he* personally is "whiter than snow" and it is the others that have to be made responsible for the mistakes.

Let you not be amazed, reader, by what I am just telling you. You rather should be surprised if things should run otherwise.

In fact, it is simply a question of human nature. It should be called rather "*human foolishness.*"

Everybody tries to excuse himself and shift the responsibility on his neighbor's shoulders.

In badly organized factories everything is exceedingly complicated. The duties of everybody are not very clearly defined and no practical and intelligent record exists of everything that is going on.

This being the case it is much easier for an ill-intentioned fellow *to deceive*, than for any responsible officer to detect deception.

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Conclusion

I advise that:

"You must do everything possible to investigate fully and as constantly as possible, all instances similar to those that I have pointed out at the beginning of this chapter. Then you will succeed in suppressing totally all kinds of waste. You can then count on a very happy result which will prepare the way for the introduction of refinements of various kinds.

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FALSE IDEAS IN FACTORIES

Their Origin, Nature and Influence

False Ideas Innoculated in Most of Those Belonging to the Industrial World From Their Youth Up Are the Chief Reasons for the Deplorable Results Obtained in Some Industries

The curing and preventing of dangerous epidemics such as typhoid, diphtheria, etc., became possible when the bacilli (source of all the evils) was discovered.

The most dangerous bacilli of industries is false ideas resulting in squandering of energy and money.

The evil can only be prevented by a radical change in the method of training professional men, hence the importance of this chapter.

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I am undertaking a hard and ungrateful task. I shall be forced to tell my readers that certain of their ideas on certain subjects are inexact and that *to have no ideas at all would be better than to have the false ones to which they are so firmly attached.*

It is very disagreeable, I know, but I shall do so, nevertheless, being certain that I am acting in the interest of the truth.

I will only add that some of my readers also may well find that my "ideas on certain subjects are inexact" and they may also claim to do it solely in the interest of truth (of which I claim no monopoly). Very well then, as the shock of ideas always produces light, we may have the good fortune to find the solution of a rational organization of factories.

From the explanations, drawings and photographs given in this series of books it can be seen that it is really very easy to pick up money in every nook and corner of almost any factory.

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Very often it is only necessary to stoop in order to pick up the money. It is certainly not more difficult than that.

> I must confess that this state of affairs puzzled me enormously. I made the following reflections: It is certain that any manufacturer, no matter how rich, would not hesitate to pick up a dollar lying on the ground.
>
> A dollar do I say?
>
> He would pick up a coin of any value at all, but the same manufacturer does nothing whatever to collect *a fortune* lying on the ground in his own factory.
>
> Coming back to my subject, I will say that I concluded from everything I saw during my investigation trips in European factories as well as in America, that the number of even fairly well organized factories is ridiculously small, and that in America as well as in Europe it would be illogical if not dangerous, for the welfare of the plants to attempt to reorganize them according to the last word in perfection, before putting them on a basis of good, sound common sense.

To those who ask how such a thing is possible, I answer that I am inventing nothing; there is not the slightest doubt that this is the case.

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In a single hour any manufacturer may check it up for himself. The verification is very easy. All he needs to do is to go through the factory and compare what he sees with what he has read in my books.

The reader, after having paid due attention to my various statements, will agree with me that the poor results obtained in industrial undertakings are to be attributed to inadequate working methods.

With this end in view, it is now necessary to find the *causes* for this state of affairs.

Once we know the causes, it will be easier to determine what proper remedies are required.

A long study of these questions has proven to me that the *main* causes are as follows:

1. The systems of *preparing* the youth for any career in the industrial world, and
2. The methods used for *aiding* all persons to *develop* continually their technical knowledge (acquired in technical schools) in order

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to keep it always up to date for the rest of their lives are more or less faulty.

My statement applies to all those who make their living in industrial enterprises, no matter what kind of position they hold, be it president, director, superintendent, engineer, draftsman, workman, or employee of the so-called commercial section of any given industry.

In a word, this statement is true when applied to the man holding the *highest* position, as well as when applied to the man holding the lowest one, say, for instance, the position of an office boy.

Remarks

Concerning the commercial education of those who belong to the industrial world, I have treated these questions at length in a series of articles which appeared in the Engineering Magazine of August, September, October and November, 1915.

I have shown what kind of particular education should be given to the man who intends to devote his life to the commercial end of the enterprise. To judge from the number of newspapers (more

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than 75) which have reproduced these articles and by the letters I have received from the most eminent authorities in the United States, I believe that I "hit the nail on the head."

I hope that the ideas I am giving now concerning the education of *professional men* will find as warm a reception with those who have the *right* and even the *duty* to think of the future of individuals, the education of which has been entrusted to them by the nation.

The results of this bad preparation are evidently numerous, but one can divide them into certain groups. These may seem to be difficult to classify, because all originate more or less from the same source. However, I shall try to group them under four different heads. This will facilitate the explanation and in no way change the essential facts of the case.

The five principal results do not keep us waiting very long. As one can see the ***industrial world*** is

1. Drowned in "false truths."
2. Giving more importance to "form" than to "substance."

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3. Unable to reach the real truth because of "false dignity."
4. Neglecting to direct all efforts towards the aim to be reached, and in consequence it is impossible to obtain any positive results.
5. Not able to overcome the innumerable difficulties encountered on the way because of an almost constant lack of good sense, sincerity, spirit of justice, good will, energy, and perseverance.

In short, as a general rule, everything must be paid for in this world. The fact that the professional men are very badly prepared for their positions is the cause of the deplorable results which may be observed in nearly all factories. As I have always said everywhere, there are fortunes to be picked up in the corners of every factory.

FIRST EFFECT

"False Truths"

Most people lack the gift of distinguishing readily between *real* and *false* truths. The latter, however, are most dangerous for the interests of an industry.

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It may be categorically stated that most bad results obtained are due to the fact that everybody light-heartedly embarks on a so-called or *apparent* "truth," which resembles and is easily mistaken for *real* truth.

I gave in my series of books many instances explaining fully what I understand by "false truths."

I find it necessary to restate *some* of them.

Under "false truths" I include, for instance:

1. The state of mind of a head (high official) who, instead of watching all subordinates constantly, advising them judiciously, and controlling them minutely, amuses himself by doing personally (under the pretext of zeal) things which one of his subordinates could do much better, faster and, above all, cheaper.
2. The refusal, under the claim of economy to expend even a small amount of money, when such an expenditure would obviously bring about a very considerable future saving.

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3. The opposite case of spending a pound to gain an ounce.

4. The attempt to obtain the greatest possible amount of output from the workmen (by wasting one's time in extremely complicated and expensive methods of study, etc.), instead of replacing hand work (when this is quite possible) by a machine or some mechanical device.

SECOND EFFECT

"Form" instead of "Substance"

I find in our system of educating men the great fault of always looking out for the *form* in nearly all the questions to be solved, and often, if not always, neglecting the *substance.*

It is considered as being always essential to save one's face.

The principal worry seems to be how to *make them believe what you want them to.*

NOTE.—I am far from being opposed to the attempt to obtain the maximum output from the workman, and still less am I opposed to the various modern methods. I only find fault with the bad utilization of these systems.

There are many intelligent men who are able to recognize the absurdity (I am trying to express myself very *mildly*) of this manner of proceeding. But that does not prevent these same persons continuing on the *same* wrong path as *before*. They would not even raise a finger to try to improve themselves, and *still less* will they try to improve *others*. They are perfectly satisfied to let others "*try it and break their neck*." All that you can expect from them is a "*non-resistance policy*."

THIRD EFFECT

"False Dignity"

I am inclined to attribute the bad state of affairs in industries mostly to the engineer himself, because most of them suffer from "*false dignity*." This is due to the fact that they have a false idea of the engineer's place in manufacturing. That is to say—they think that an engineer must constantly be inventing. He must be, so to speak, a miniature Westinghouse, or must be always solving problems that are very important because very complicated—and it is beneath their

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dignity to bother with the small details of business. They, therefore, put off these details on their subordinates (foremen, clerks and others).

If, at least, they take the trouble to see that others attend conscientiously to details, there would be no harm done; but, in most cases, they neglect this completely, and the subordinates, modeling themselves after their chiefs, have their own "*dignity*" and are equally negligent. It is, therefore, not astonishing that certain factories die of dry rot, and undergo constant losses.

It is this *excess of dignity* that is often the cause.

The engineers make their mistake in forgetting that it is only in school that we must daily solve those interesting and complicated problems that are so little used in real life (such as for instance those dealing with equations with triple integrals, and their like.)

In real practice these complex problems are not as important as so-called minor problems which seem to be (and very often are) extremely simple,

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but the results of which may be of the greatest importance. For instance:

1. A figure carelessly written in an order,
2. A dimension badly indicated on a drawing, or
3. Neglect of belts, cutting tools, the oiling of the gears of the machinery which may cause a great amount of trouble and a constant and serious material loss.

In an example that I gave, it was seen how much trouble, loss of time and money, was due to the fact that the columns of formulæ used in an important industry had not the same width, arrangement and designation.

For my part, I consider that it is precisely *the thorough knowledge of all these matters, however small and uninteresting they may appear at first sight (and they are innumerable in any industry), which makes it possible to solve with perfect facility all the larger problems that may present themselves in relation to the rational organization of a factory.*

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FOURTH EFFECT

All the Efforts are Not Directed Toward the Goal to Be Attained

Everyone knows, of course, that, if a person wish to accomplish a certain result, he will arrive much quicker by concentrating all his thoughts so as to make all his efforts converge toward this end. That is to say:

1. Each time he speak or express an idea in writing (articles in the paper) or find himself confronted by a choice of means to employ, he must have constantly in view nothing but the desired result.

He must constantly ask himself: ***"How must I speak, think, and act, in order to obtain the desired result most readily?"***

He must set in action efforts only along the same line and in the same direction, for any effort that does not fulfill these conditions will necessarily lose a part of its useful force, since it must be *subtracted* from the sum and thus delay the accomplishment of the result.

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HOW IS THE INDUSTRIAL WORLD TECHNICALLY EDUCATED?

It is worth while to know *where*, *when*, by *whom*, and by *what* methods the industrial world gets its education. Evidently

1. In the schools.
2. In the laboratories.
3. By excursions to various factories.
4. By lectures in different societies.
5. By articles in the technical press, and finally,
6. In the factory itself.

How Education is Given in Technical Schools and How Most Professors Teach Their Pupils

The professor in the schools has naturally his "dignity" to maintain and cannot permit himself to fall "so low" as to study questions that the "world" considers unimportant and even ashamed to discuss.

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Since this is the case, *how can he teach his pupils what he does not know himself and does not want to know?*

It is true that many schools possess superb workshops, laboratories, and the like, where the students must work for a certain time and make for themselves a prescribed piece of mechanism. They have, therefore, it is said, the occasion to acquire "practical knowledge."

Let us see what this is worth:

Everyone who has worked in these shops and laboratories knows that most of the students manage to have the foreman or instructor perform the more difficult operations. (At the end of the school year the students give the foreman a complimentary address, and make up a purse for him.)

It is essential that the work shall be finished by the date fixed in the academic calendar, but under *what conditions* and by *whom* the work is done is

NOTE.—Some of my comrades—engineering students at the University—were in the habit of wearing *gloves* to work in the shops. They were disgusted with the "dirty, oily tools."

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of "minor" importance. So here again it is the "form" and not the "substance" that takes the first place.

However, suppose even that the student has done his work himself.

What then?

What has he gained?

The student has learned more or less how to file, drill, turn, etc., and to tell the difference between a lathe and a planer. This, of course, is *something*, but by no means enough. Evidently this "practice" has little in common with what he ought to have learned in order to obtain truly *practical* ideas. Ideas that would allow him to *see* things as they should be seen and to *know* how to *draw* just conclusions concerning them.

Academic Excursions—Their Utility

The So-called Broader View of Industrial Problems Acquired by these Excursions

All the students of the technical schools (ordinary and post-graduate) visit every year a great

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number of factories under the direction of their professors and the guidance of the proprietors of the shops or their representatives.

This is surely better than nothing; but we must open our eyes and not be dazzled by "false truths." I am quite convinced that the value of these excursions, so far as the acquisition of practical knowledge is concerned, is just about nothing.

There is no other country, except Switzerland (and possibly Belgium) where these excursions are so much in favor. I have gone on a great many when a student in the Technical School of Bienne, Switzerland.

Every time we presented ourselves at a factory to visit it, we were first conducted to the home of the proprietor. There we were served a good dinner, with wines and liquors, the classic champagne; and the no less classic "after dinner speaking" was never lacking.

But if we waited eagerly for the arrival of the famous "Veuve Cliquot" champagne, we waited not less eagerly for the end of the speeches. . . .

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When we left the table, having dined not wisely but too well, we had no more energy and desire to go and "learn in the factory" than we had the will power and force to resist gorging ourselves with the tempting dishes that the too hospitable owner had offered us.

Finally we were divided into groups of from twenty to thirty students. Each of these groups were entrusted to a guide who explained the works to us. Every time he came to something that he considered interesting, he called our attention to it.

Let us consider, now, what could be the value of those explanations.

The mental state of the guide was in every way similar to that of his audience, for he also had participated at the feast. But if he, the guide, were more or less prepared to know what he wanted to explain to his audience, the latter, on the other hand, was not prepared at all. So that if one did not know before hand just what new things would be shown, he understood nothing of what he heard.

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Again, how much did he hear?

This is quite doubtful, for in most cases it was absolutely impossible that all the thirty students could find room before the guide.

To begin with, the explanations were given in the shops, before the machines, where there was not sufficient space to permit the thirty students to listen in comfort to the guide.

Moreover, the deafening noise of the machine tools, the gearing and belting, the traveling cranes, the steam hammers, etc., made it impossible to hear continuously. *We picked up a bit here and there, but that was about all.*

If you consider also that very few persons are capable of giving an explanation that is clear, simple and agreeable, even in talking on subjects that they know very well themselves (for this is a gift that not everyone possesses), you can readily understand that the result of these excursions was most unsatisfactory.

It is even better understood if you know that in Switzerland the factories are very close together.

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Therefore, to gain time (?) and increase the "results" of an excursion, our professors arranged to have us visit several factories in the same day. In this manner we managed to have luncheon in one factory, afternoon tea in a second, and dinner in a third: You were *quite sure*, on arriving home in the evening, of *a good case of indigestion, but far less sure of carrying away the least scrap of useful knowledge.*

How Men Engaged in the Industrial World Perfect Their Technical Knowledge During School Days and in Practical Life

From what has just been said it is not in the schools that the attention of the professional man is drawn to the true importance of these so-called "small details." It is a result of too much "dignity" and of letting one's self be dazzled by "false truths" and by giving the precedence to "*form*" instead of "substance," that the results obtained are so mediocre.

Let us see how things pass in *practical* life.

On leaving school, the *future* director, engineer, etc., finds the following means, by which he may

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acquire new ideas which he did *not* possess before, and may **perfect** the studies that he had begun to acquire in the school:

I. Technical lectures in different societies.
II. Articles in the technical press.
III. Personal observation of the manufacturer himself in the factory.

I. Technical Lectures

These are usually given under the auspices of academic authorities, or of societies of engineers and technicians.

Let us consider

1. The *purpose* of these lectures
2. The *subject* usually treated, and
3. *How* they are usually given.

It is generally believed that these lectures are useful to the manufacturers, both in teaching them *new* and useful things bearing on their specialty, and in *perfecting* the knowledge that they began to acquire when still in school.

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Unfortunately this is another "false truth," for the lecture committees, as well as the lecturers themselves, do *not* always keep in mind the *purpose* it is desired to obtain.

In fact, what are the *subjects* usually chosen by the lecturers?

The lecture committees of any technical society will seldom invite anyone to speak on a subject that has not a "high-sounding" title.

It seems that they care very little about the utility that the subject chosen may have for the majority of their members. Above all, it is the *title* of the *lecturer himself* and after this the *title* of the *lecture* that they consider most.

It is possible, perhaps, that a lecture might be given on the calculation of a traveling crane, a locomotive, or some newly invented machine tool, but I have never heard of a lecture dealing, for instance, with the best methods:

1. Of oiling a machine tool.
2. Of sharpening cutting tools (form, angle, temper, etc.).

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3. Of keeping belts in proper condition.

4. Of storing, recording, repairing, etc., the stock of small and even large tools.

5. Of, *when* (in working hours or after closing time) should the belting, machine tools, etc., be repaired and how one should keep the account of the work and materials necessary for this work.

6. Of how to rationally install a supply department, so as to be able to buy the *proper goods* at the *closest price*, at the *right time* and in *reasonable quantities*.

7. Of how to figure correctly the necessary time for *deliveries* so as to avoid the troubles that one may have because the time needed is hardly ever thought of.

8. Of how to *store*, *mark*, take inventory, check up, repair, etc., the wood patterns used in foundries, and yet, these patterns represent

not only an important capital badly utilized, but a constant source of great difficulties when no special method is adopted for taking care of them.

9. Of how to work out the best method of organizing the conferences between the heads of a business and their immediate subordinates.

   I have never noticed that anyone cared to find out *when*, *how* and *where* best to pay workmen their wages.

10. Of ascertaining by *whom* workmen and other employees should be engaged, or *how* to determine what kind of work is suited to each workman, etc.

I might cite hundreds of similar questions that almost any manufacturer would consider "minor details" which might be worthy of the consideration of foremen and clerks, but which his "dignity" would prevent him thinking of for himself.

Yet, think of the *abuse* and *negligence* and consequently the loss of time and money and the

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unnecessary worry caused by lack of attention to these subjects.

How Lectures *Are* Given

I have very often had the impression that many of the lecturers think the only purpose their audience has in view is that of coming to admire their superb oratorical powers, and to make sure how well they (the lecturers) know their subject.

Like all engineers, I have been present at hundreds of lectures, where I have noticed that most of the lecturers have a real talent for torturing their hearers. That is, they lose themselves in dry theories, in complicated conceptions, which they base on long and incomprehensible formulæ derived from various branches of science (mathematics, physics, chemistry, etc.) without taking care to recall at least certain *elementary* ideas that are absolutely indispensable for the understanding of the subject treated.

What is the result?

All these reasons explain sufficiently why this type of lecture fails to entertain (to say the least) those who can make up their minds to attend.

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It is, therefore, not astonishing, that the resulting attendance at these lectures, as well as the benefits derived from them, are not very great.

To prove this is not fiction, let me quote the following example: I have often been present at lectures where so called practical questions were treated. The lecturer always began by pronouncing the traditional phrase:

"Gentlemen, as you know very well . . . " and then continued by telling things that nobody knew, or at best, their knowledge of the subject was vague.

I began to ask myself what this phrase "You very well know" might really mean, for if we knew all about the subject we would hardly need attend the lecture.

As the lecturer neglected to give the elementary explanations, what happened was that I understood almost nothing of what he was trying to say. I naturally thought I might be the only listener so unfortunate, and I spoke to one of my neighbors, asking him if he understood anything.

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He frankly replied in the negative.

I am convinced that if I had put the same question to the others present, they would have said practically the same thing.

What must we conclude?

We were present at a lecture where the audience grasped the subject imperfectly. We may even say that *before coming to this lecture we knew very little or nothing about this question, and now, after hearing the lecture, we did not know much more. . . .*

II. Articles in Technical Journals

Is the manufacturer able to increase his knowledge from them, or to get new ideas?

Here, as elsewhere, everyone lets himself be drawn away from the true purpose, either by "false truths" by thinking too much of "form" or by "excess of dignity."

In order to demonstrate this, let me tell of an experience which I had very recently.

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Almost everyone in France knows the legend according to which the great Moliere was in the habit of asking the opinion of his cook as to the quality of his works before having them printed.

This opinion served him as a "feeler" for that of the general public. I wished to imitate his example with slight improvements, so I showed some of my articles to acquaintances in different walks of life.

Nearly all replied: "The ideas are true, but they are not 'strong' enough for a *review* read by engineers and captains of industry."

Or again was I told: "These details are certainly very interesting, but after all they are only *details*. Besides, while the articles are clearly and simply worded, the style is not eloquent enough and in no way resembles what the majority of engineers and factory managers *prefer*."

On thinking it over, I am afraid that they are right, *i.e.*, my acquaintances; I see that they have been good observers.

Now, really, it is a shame that such a state of

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mind should exist in a supposedly superior body of men, who pride themselves on having *positive* and *practical* ideas. I think it necessary to consider in detail the three persons entering into the question; namely,

1. The one who *writes* the article.
2. The *editor* who publishes it, and
3. The *reader*.

I shall consider only the case where the writer of the article as well as the reader to whom it is addressed belong in the same group, that is to say, that both the author and the reader are manufacturers.

Considerations Relative to the Author

As is well known, nearly all our colleagues, professional men in general, are unable to write (in a literary sense) and are not always greatly distinguished by their eloquence. This is above all the case with those who pass the greater part of their lives in factories—a world that scarcely favors the development of these qualities. Therefore, nothing can be done in this respect. You can merely record the fact and that is all.

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Is it after all such a very serious defect?

I scarcely think so.

Since the industrial engineers do not pretend to be *literary* men or *statesmen*, one may say that, ***if by*** chance, they happen to be eloquent, it is so much extra to their credit; for they add another good quality to those they may already possess.

On the other hand, the lack of eloquence is by no means to be considered as a defect. The essential is to be *clear*, and at the same time relatively *concise*, and to try to make the task of reading as *agreeable* and as *easy* as possible.

Flammarion, the celebrated French astronomer, Claude Bernard and many others have offered magnificent examples. It is not necessary to be an astronomer or a physicist to understand their respective articles with facility. Even a mind not altogether fresh does not find it too difficult to read them in peace and comfort (in a railroad train or a trolley car for instance).

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Is it then astonishing that you find many persons who take an interest in reading articles on astronomy and liquid air, who otherwise would never in their lives have had the idea of reading about such dry subjects?

How Lectures *Should Be* Given

Just as a Professor of Mathematics, for instance, however deep and eloquent he may be, should attempt to give his lecture course to the *children* of a primary school using the *same* reasoning that he would have used in addressing a *congress* of *professors* as learned as himself, would certainly not deserve to be ranked as a good professor. Similarly it cannot be said that a person is a good lecturer simply because he speaks eloquently on a chosen subject.

In my opinion, the adjective "good" is only properly to be applied to one who is capable of *quickly and correctly determining the mental level of those with whom he finds himself.* Thus he will know *what kind* of *examples* to choose, what *methods of reasoning* to adopt, in demonstrating what he wishes to explain, so as to adapt

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himself to the kind and the degree of intelligence of those who listen to him.

Admitting this, a lecturer should constantly keep in view these points:

1. That most of those present at the lecture have been away from the University for a long time.

   They are, therefore, very far indeed from all theoretical questions, and consequently must make a considerable effort to recall the conceptions in question.

2. That when a professional man attends a lecture in the evening, he is not always fresh and alert.

   He is more or less fatigued by the day's work, and cannot, therefore, concentrate all his faculties on the subject treated, and it is, therefore, absolutely necessary that the lecturer should remember—

3. To enter into certain details and to give certain elementary ideas on the subject he wishes to treat.

   Persons who are not familiar with these elementary ideas may thus equally understand him and follow the development of the subject without undue fatigue.

NOTE.—I know very well that there are many persons in every audience to whom certain details will appear unnecessarily clear or even quite superfluous. It will, therefore, bore them to hear these repeated once more, but they should remember that these details are necessary for the others present, and should show a little patience and consideration.

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4. He should not try too hard to maintain his "dignity."

   He should, therefore, not be afraid of uttering a pleasantry from time to time. *A smile brought to the listeners' faces awakens their interest and prepares them to listen more attentively, and more sympathetically.*

5. He should avoid in every way a monotonous manner.

   If the lecturer himself be not electrified while speaking, it shows that he is not very much interested in his own subject. How then can he expect others to be interested in it?

In conclusion: The lecturer should manage to treat his subject in such a way that at any rate, the majority of those who are present at the lecture may say to themselves, as they leave,

"*Not only have we gained a more exact knowledge of this question, but we were so entertained that the time did not seem unreasonably long. Really, we have no cause to regret the time we spent here.*"

How *to Write* for a Technical Journal

Here, in short, is what you must think of in writing articles for the technical journals, if you wish

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these articles to be read without too much fatigue, and above all with profit to the reader.

In general, those who wish to write articles on a given subject should take into consideration the *type as well as the physical and mental state of those who may become their readers at the moment that these latter will be likely to take up the articles in question.*

Now, in the case which at present interests us, it is a question of professional men; but this class of readers has no time to glance at scientific papers, except in their *idle moments;* that is, *when the numerous technical and administrative questions (of which they have assumed the responsibility) do leave them some leisure time.* Accordingly, it must be assumed that the mind of the reader is already fatigued at this moment. It would be inflicting an unnecessary hardship on him to ask him to read articles that were not written *simply, clearly, and even agreeably.*

And so the readers may not find in these articles either very eloquent language (which very often

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signifies nothing), or grand phrases which demand effort if we wish to decipher their meaning. What is absolutely necessary is to tell the *real facts* in the most interesting manner. When this rule is not observed there is the risk that the reader, even though he have a good stock of patience and is willing to read articles treating dry subjects, may lose patience and throw the "serious" article in the waste basket, with its pages half uncut, or as a very intelligent publisher said when speaking about "*serious technical books*," these books are *published* but *not sold.*

As for the Editors of the Technical Journals (or the so called kings of the scissors and the blue pencil) they all are more or less at fault, so much so that in many cases *their papers are thrown away without being looked at.*

Here is the reason:

Most of them, being obliged to read conscientiously every day many articles dealing with subjects as interesting as they are varied, have developed their faculties of comprehension and

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criticism to such a point that they can grasp rapidly and easily almost any idea that is set before them.

This is the sugar-coating, the pill is to follow.

Unfortunately, these excellent qualities have been developed *at the expense* of their *imagination.* In fact, they can no longer imagine that anyone else (except, of course, other editors like themselves) can compare with them in their own field, and to economize a bit on paper, they cut into the body of the text with their terrible scissors, so that often the ideas in escaping from their operating table, *have lost their sense* and become "neither fish, flesh, nor good red herring."

They, the editors, have understood the matter completely (having had the *full* text before them) and that is all they care about.

But the *readers cannot say as much,* and since they *cannot make head or tail of what they are reading,* they throw away the paper without having read more than the title and the opening paragraphs of each article.

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